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Journal

of The AMERICAN DIETETIC ASSOCIATION

DECEMBER 1961 VOLUME 39 NUMBER 6

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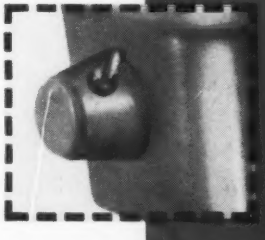

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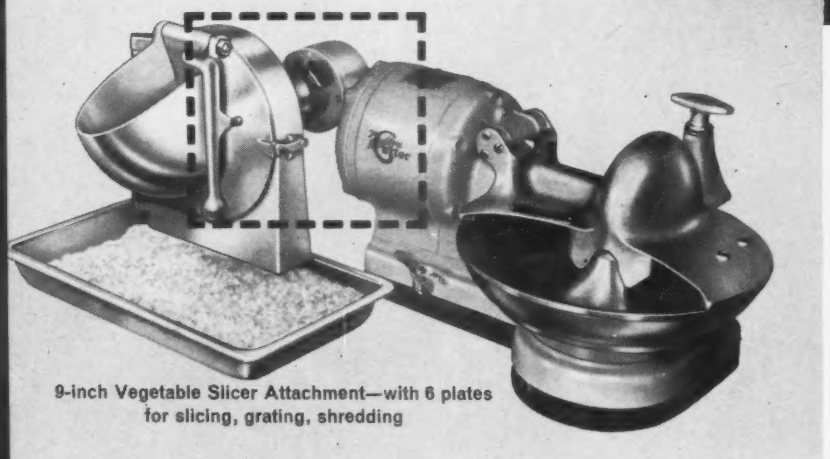

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Subscription Rates: $8 per year in advance in the U.S., Canada, and countries of the Postal Union; all other countries, $9 per year in advance. Special rate to undergraduate students and dietetic interns in approved internships, $4 per year in advance. All correspondence concerning Journal subscriptions, orders for copies, or reprints from the Journal, and notices of change of address should be sent to The American Dietetic Association, 620 North Michigan Avenue, Chicago 11, Illinois. Notices regarding change of address should reach the publisher by the *5th of the month before the date of issue* on which the change is to take effect and both old and new addresses *must* be given. Claims for Journals lost in the mail will not be entertained more than six months after the date of the issue involved.

Editorial Correspondence: All articles and notices for publication, general correspondence, and inquiries should be sent to the Editor at The American Dietetic Association, 620 North Michigan Avenue, Chicago 11, Illinois. Manuscripts are accepted for publication on condition that they are contributed solely to the Journal. Copy must be typewritten, double-spaced, and two copies, an original and one carbon, submitted.

Advertising: All correspondence concerning advertising should be addressed to The American Dietetic Association, 620 North Michigan Avenue, Chicago 11, Illinois.

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CONTENTS / DECEMBER 1961 / VOLUME 39, NUMBER 6

Radioactive Contamination of Food
L. R. SETTER 561

Effect of Bone on Sr-89 and Ca-45 in Beef Roasts
M. C. BELL, Ph.D., AND R. G. BUESCHER 567

Diets of Pregnant Women in Kauai, Hawaii. Two Dietary Survey Methods Compared
RUTH L. HUENEMANN, D.Sc., FERN E. FRENCH, Dr.P.H., AND JESSIE M. BIERMAN, M.D. 569

Household Records of Foods Used and Discarded. A Pilot Study in St. Paul
SADYE F. ADELSON, ELAINE ASP, AND ISABEL NOBLE, Ph.D. 578

Malnutrition in Angola
ALICE K. STRANGWAY 585

Frozen Precooked Sauces
RUTH JORDAN 590

Food Preferences of South Dakota College Students
CECILIA SCHUCK, Ph.D. 595

Association Section
Mary W. Northrop Named 1961 Copher Awardee 598
Dr. Williams Is Made Honorary Member of A.D.A. 599
Gertrude G. Blaker Becomes 1961 Mary Swartz Rose Fellow 600
Mead Johnson Awards for 1961 600
Mary B. McCann Wins Lydia J. Roberts Essay Award 601

Current Comment
Shakespeare's Use of Food in the Historical Plays—
O. B. EMERSON 602

Current Literature 605

News Notes 620

Index to Volume 39 636

Author Index 641

Periodicals Abstracted in the Current Literature Section of This Journal 642

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Radioactive Contamination of Food[1]

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CONTAMINATION IS usually defined as active polluting or making impure. The potassium content of food can hardly be considered contamination, yet a small but readily measurable fraction of natural potassium in food is the radioactive potassium-40 isotope. Non-radioactive elements are not contaminants unless they are present in concentrations exceeding a threshold value below which there is no harmful effect. It is generally accepted, however, that there is no threshold for genetic effects resulting from radiation. It follows that there is some risk, though it be small, associated with *any* level of radioactivity. The high radioactive content found in some well waters (1, 2), or which may be present in certain foods, are examples of natural radioactive contamination.

The more popular concept of radioactive contamination has been associated with radioactive fallout from the testing of nuclear weapons. Several hundred different radionuclides are formed in the fission reaction, and bomb material which is not fuel becomes radioactive by neutron bombardment. There is little control over the distribution of this material, but the composition of materials of construction, the type of fuel, and the location of the bomb when exploded will alter the amount and widespread distribution of radioactive contamination.

In addition to contamination arising from the use of nuclear bomb explosions, there is the potential contamination from air-borne and water-borne wastes accidentally or intentionally released from a nuclear facility, or from the industrial, medical, or institutional use of radioactive nuclides. Contamination from these releases presents problems similar to those with which industry and public health authorities normally deal. For example, the contamination of water and the atmosphere is controlled through treatment for the removal of the more toxic components, and the gas and liquid wastes are released under rigid control for adequate dilution. Only small areas would be affected, and these would be under surveillance by the competent authorities.

Radioactivity from Nuclear Explosions

Let us now turn our attention to information on radioactive fallout from test explosions of nuclear devices. Initially a world-wide monitoring network was established by the Atomic Energy Commission to evaluate the extent and distribution of radioactive deposition on the earth's surface. This network was later expanded to include stations in each hemisphere, particularly in the northern hemisphere. A square foot of paper with a gum-coated surface was exposed for a 24-hr. period at each of the stations. After the sample was removed, a new paper was placed in the collector. At the time of the moratorium on nuclear testing, air particulate samplers and rain or snow collectors were being operated by the AEC, the Public Health Service, institutional, state, and municipal groups in this country, and by many other countries, particularly in the northern hemisphere.

Meanwhile, AEC and similar groups of other nations were sponsoring or conducting research to assay the uptake of radioactive nuclides by biologic organisms in order to predict radiation effects from the ingestion or the inhalation of radionuclides as well as the beta-gamma effect from external exposure. From these and related studies, national and international committees prepared recommendations of the permissive burden of radionuclides for the body and derived, therefrom, permissive levels of radioactive contamination of the air, water, and food (3, 4). For example, if strontium-90 is the only nuclide of concern, then the average daily intake permitted from inhaling and ingesting food and drink would be less than 70 micromicrocuries per person of large population groups.

Fallout, originally considered to be dry particulate matter, contributes most of the radioactive deposition near the test site. At more remote locations, the

[1]Presented at the 40th Annual Meeting of the Ohio Dietetic Association in Dayton, on May 21, 1961.

fallout material is largely associated with washout in rain or snow. Depending on distance from the test site, meteorologic conditions, and the occurrence of tropospheric atomic clouds in relation to the plant growing season, the radioactive contamination of food may be due to:

(a) Direct impingement of fission products onto plant tissue.

(b) Direct rainout on surfaces of growing plants.

(c) Uptake of fission products from soil by plant tissues.

(d) Transference of radioactivity from animal diet (water or plant tissues) to milk or animal tissues which then serve as human food.

(e) Translocation of contaminated soil to plant tissue by action of rain, wind, and so on, and subsequent consumption by man or animal.

Of these major types of contamination, direct deposition and soil-to-plant uptake are likely to contribute most of the observed radioactivity in plant tissue. The first is independent of soil character and plant nutrition, whereas soil-to-plant uptake depends on metabolic processes which may discriminate between nuclides in fission material.

Of the forty or more nuclides in fission material, considered because of their yield and physical half-life (5), the biologically important nuclides are strontium-90, iodine-131, cesium-137, and to a lesser degree, barium-140 and strontium-89. Each is fairly readily absorbed by the body when compared with other relatively insoluble nuclides, such as cerium and the rare earth elements. The insoluble beta-gamma emitters when ingested cause radiation exposure of the gut and the whole body as food wastes move through the alimentary canal, whereas the absorbed elements may concentrate in specific tissues. Thus, iodine-131 is concentrated in the thyroid, and strontium and barium are concentrated in bone tissue near the blood cell-producing tissue. On the other hand, cesium is quite mobile, being distributed in the blood and muscle tissue and having a relatively short biologic half-life compared with its physical half-life.

Strontium-90 and Calcium

An *ad hoc* Expert Committee on Radioactive Materials in Food and Agriculture assembled by the Food and Agriculture Organization considered the problems of radioactive contamination of food and agriculture (5). The committee reviewed the present knowledge of the behavior of radioactive substances in terrestrial and aquatic food chains, and agricultural practices which affect radioactive contamination of human diets. In discussing the behavior of strontium, it appeared that one-fifth of the strontium-90 in milk was contributed by uptake from fallout deposited on soil, whereas the bulk of the contamination was from plant-base, foliar and floral adsorption on herbage. Since about June 1959, when new fallout diminished to minor values, uptake from soil to plants, and hence to milk has been the important source of strontium-90 in the diet.

Stress was made of the effect that calcium in soil will have on the contamination of plant tissue and, similarly, the importance of the "OR," or observed ratio, of sample to precursor, i.e., the ratio of strontium-90 per unit of calcium in the sample to the strontium-90 per unit of calcium in the precursor. "The bone-to-diet OR values for laboratory and domestic animals under usual dietary conditions appears to range from 0.18 to 0.35 with most values falling around 0.25. The milk-to-diet OR for domestic animals appears to range from 0.09 to 0.16 with most values falling close to 0.11" (5). The bone-to-milk OR of 0.25:0.11 or 2.3 indicates that the mean strontium-90:calcium in cow's bone would be 2.3 times greater than that in her milk.

> "The concept of the OR (observed ratio) may permit:
> (a) prediction of total body burdens from dietary values;
> (b) prediction of total diet values from tissue or excretion measurements"(5).

This consideration of the OR concept brings into focus the importance of the composition of diet with respect to calcium. Study of data from food balance sheets suggests four broad categories of diets containing a daily calcium content per person of:

(a) Over 800 mg. (70 to 90 per cent derived from milk produce) for North American and most European countries;

(b) 600 to 700 mg. (60 to 80 per cent derived from milk produce) for Southern European countries, such as Italy, and some Latin American countries, such as Argentina and Uruguay;

(c) 300 to 450 mg. (30 to 65 per cent derived from milk produce) for countries, such as Egypt, Turkey, India, Pakistan, and the Union of South Africa;

(d) 200 to 350 mg. (about 25 per cent derived from milk produce) in such countries as Chile, Ceylon, and Japan.

The calcium of diets low in milk and milk products is derived from cereals, legumes, nuts, and vegetables. These diets usually are lower in total dietary calcium. In some cases, calcium may come from an unexpected source. For example, the wheat flour used for bread in the United Kingdom contains *creta praeparata* (calcium carbonate), and the dietary calcium of some Latin American countries is enriched by steeping the corn in boiling lime water prior to making *tortillas*.

Other Radioactive Substances

In contrast to strontium-90, cesium-137 is usually retained in the soil in forms which are largely in-

accessible to plants. Cesium-137 in plants, arising largely from direct deposition, is quite free to move from leaves to roots. It is efficiently absorbed from the gastrointestinal tract, secreted in milk, and accumulates within the cells of the body, being physiologically similar to potassium. Based on limited data, the more important dietary sources of this isotope are meat and milk.

Because of the short half-life of iodine-131, it is only necessary to consider the contamination of foods which may be eaten shortly after contamination has occurred. Perishable products such as liquid milk, leaf vegetables, and berries are examples. The quantity of iodine-131 which reaches milk will depend on the extent to which it is deposited on grasses consumed by milking cows. Experience gained from the accident at Windscale, England, in 1957 showed that where the iodine-131 contamination of pasture grass was 1 microcurie per square meter, the level of contamination in cows' milk was about 0.1 microcurie per liter.

Most other microcurie radioactive substances are poorly absorbed from the gastrointestinal tract of man and animals and, therefore, are of minor concern in food. Limited data indicate that the following percentages of ingested materials appear in the milk of the cow: barium-140, 0.4 per cent; zinc-65, 5 per cent; cobalt-60, 0.1 per cent; iron-59, 0.1 per cent. The human dose contribution of these radionuclides from foods is at present small compared with that of biologically important fission products such as strontium-90.

Dietary Strontium-90

The magnitude of contamination of various components of diets in the United States and the United Kingdom is reproduced in Table 1. From the analyses of these foods representative of each food category and food consumption data, the intake of strontium-90 and of calcium was calculated for the mean diet in the United Kingdom in 1958 and in 1959, and in three cities in the United States—San Francisco, Chicago, and New York City (6). Select diets for these three cities were sampled in the early spring of 1960 and again in the summer or early fall. The table shows the quantity of calcium and of strontium-90 derived from nine categories of food.

The dietary calcium varied from 366 to 414 gm. per person per year for American diets as compared with 359 gm. for the United Kingdom. The strontium-90 in the mean British diet for 1958 and 1959 was 2332 and 3576 micromicrocuries per person per year, respectively, as compared with a range of from 1285 to 4376 for American diets. When computed as the strontium-90:calcium ratios in micromicrocuries per gram, the 1958 and 1959 British diets were 5.9 and 9.0 respectively, as compared with a range of 3.1 to 12.3 for American urban diets in 1960. In the order of importance, milk products, cereals, and vegetables contribute 85 to 90 per cent of the calcium and 80 to 95 per cent of the strontium-90.

The 1959 intake of strontium-90 in the mean British diet increased over that of 1958, but the ratio of strontium-90 to calcium is similar to that in American diets in 1960. It is interesting that British flour is fortified with calcium, and that the American bread is equally fortified by use of non-fat milk solids and possibly a mold inhibitor, calcium propionate. Based on current data on milk, strontium-90 in the mean diet of each country can be expected to decrease substantially from 1958-59 levels.

TABLE 1 **Strontium-90 in foods of human diet (6, 7)**

FOODS	AMOUNT OF FOOD*	CALCIUM		STRONTIUM-90		
		United Kingdom†	United States‡	United Kingdom 1958	United Kingdom 1959	United States, 1960
	kg./yr.	← *gm./yr.* →		← *μμc./yr.* →		
Milk and dairy products	221	216	218 —241	1530	2040	420—2430
Cereals	96	17.1	48 — 70	273	482	318—1230
Creta praeparata		88.7				
Vegetables						
Root	62	9.1	7.2—13.9	128	212	39— 531
Leaf	63	13.9	13.9—22.9	120	197	135— 643
Fruit and fruit juices	163	8.8	13.7—23.8	77	124	88— 524
Eggs	16	6.9	7.5—28.5	15	62	30— 170
Fish	9	5.1	6.0—14.8	4	4	2— 9
Meat	73	6.9	8.5—30.7	98	135	37— 139
Poultry	17	—	2.6—17.7	—	—	13— 43
Water and miscellaneous	—	22	—	84	320	—
Total	720	395	366 —414	2332	3576	1285—4376
Ratio (*μμc.* strontium-90: gm. calcium)				5.9	9.0	3.1—12.3

*From food consumption data, USDA.
†Country-wide sampling.
‡Sampling of selected foods in San Francisco, Chicago, and New York City, March—September 1960.

TABLE 2 **Human dietary intake of strontium-90 (9)**

DATE OF SAMPLING	LOCATION	TYPE OF SURVEY AND TESTS	ANNUAL INTAKE		
			Strontium-90	Calcium	Sr^{90}:Ca ratio
			mμc.	*gm.*	
1958	New York City	household diet, selected foods	4.65	370	12.6
1958	Cincinnati	household diet, selected foods	3.16	257	12.3*
May 1959	Boston	diets of lactating women	9.49	562	16.9†
August 1959	New York City	diets of children up to one year of age, selected foods	6.47	462	14.0
November 1959	Cincinnati	typical meals	6.02	307	19.6
November 1959	U.S.	adolescent diets, selected foods	7.29	607	12.0†
November 1959	New York City	household diets, selected foods	6.53	370	17.7
December 1959	New York City	hospital personnel, weekly diet	4.96	399	12.4
March 1960	San Francisco	household diets, selected foods	1.99	374	5.3
March 1960	New York City	household diets, selected foods	4.36	399	11.1
May 1960	Chicago	household diets, selected foods	4.06	367	11.1
June 1960	New York City	household diets, selected foods	4.76	388	12.3
August 1960	San Francisco	household diets, selected foods	1.29	414	3.1
August 1960	New York City	diets of children up to one year of age, selected foods	2.88	326	8.8
September 1960	Chicago	household diets, selected foods	2.99	395	7.6

*Low calcium intake.
†High calcium intake.

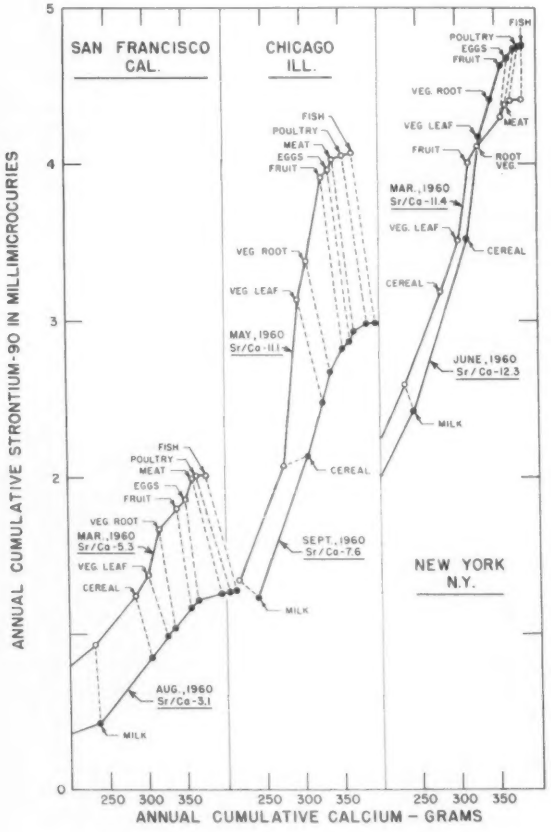

FIG. 1. *Calcium and strontium-90 in diet based on two samplings at three U.S. cities, 1960 (6).*

The large amount of data on the analysis of select foods in the tri-city study (6) has been plotted in Figure 1 to show the contribution each food category makes to the total calcium (abscissa) and strontium-90 (ordinate) in the diet.

The cumulative contribution has been arranged in order of the usual importance of the food as a contributor, i.e., milk (fluid, skim, and cheese); cereal (whole wheat bread, white bread, rice, and macaroni); leaf vegetable (lettuce, string beans, cauliflower, Brussels sprouts, spinach, and so on, either fresh, canned, or frozen); root vegetables (carrots, turnips, beets, sweet potatoes, and [mostly] white potatoes); fruit and fruit juices (fresh, frozen, and canned); eggs; meat; poultry; and fish (fish and shellfish). Soft surface water supplies, such as those for these three cities, would normally contribute a small amount of dietary calcium. However, in some American cities, the calcium content, particularly of some well water supplies, is appreciable and would affect the over-all strontium-90: calcium ratio.

It is pertinent to observe (Figure 1) that the total strontium-90 in the summer sampling at San Francisco and Chicago was considerably less than that found in the early spring sampling, whereas the New York summer diet contained more strontium-90 than the spring sampling, primarily because the contribution from cereals and vegetables was higher.

It is noted that the level of strontium contamination of milk, cereal, and vegetables was least for samples collected in San Francisco, intermediate for Chicago, and greatest for New York during both sampling periods, whereas the total calcium in the diets was fairly constant.

During the last three years, in particular, various foods and complete meals have been sampled and analyzed in order to evaluate the radioactive intake and, ultimately, to estimate retention. One such study was the Consumers Union sampling and testing of the typical diet of teen-agers in twenty-five American cities (8). Composite samples of the total diet collected over a two-week period were processed and analyzed.

Some studies have been made on a limited scale where the intake (and in some cases the excretion) of calcium, strontium-90, and other radionuclides were measured. Thus the diets of lactating women (9) and children, newborn to one year of age (9), the sampling of typical meals (10), and the weekly diet of select hospital personnel (9) have provided additional information.

These studies supplement or augment estimations of the dietary intake obtained from calculations based on dietary consumption data and the analysis of selected foods. A summary of some of these data is presented in Table 2, showing that:

(a) The contamination of American diets was somewhat higher in 1959 than in 1958 and 1960;

(b) The range of contamination by each of several methods of measurement appears consistent with each other (the highest ratio of strontium-90:calcium of 19.6 micromicrocuries per gram for "typical" Cincinnati meals [9] was unusually low in calcium);

(c) The higher estimates may be judged as contributing little additional exposure to the normal background levels.

One can surmise that the relative contamination of one food over another would be greatly affected by the choice of sampling period, particularly in relation to the harvesting of garden produce during periods of substantial rainout. Besides rapid fluctuations in milk levels, garden produce with large surface-to-weight ratios, such as string beans, leaf lettuce, spinach, strawberries, and blackberries, would alter the pattern of dietary intake. Rain falling after an atomic cloud passes over an area would be expected to wash-off radioactivity from vegetation. On the other hand, contamination of low-growing vegetation may be increased by the splashing of contaminated soil.

Adequate sampling of the large number of food items comprising the diet is very expensive in the collection, processing, and analysis of samples. Consequently, more attention has been paid to the sampling of one indicator, milk, which is an important contributor of both calcium and strontium-90. Some indication of the validity of this assumption may be obtained by a comparison of the ratio of strontium-90:calcium in milk as compared with the total diet in the tri-city study. These values are shown in Table 3.

TABLE 3 Ratio of strontium-90 in diet to that in milk*

LOCATION	SAMPLING DATE	STRONTIUM-90 IN MILK	CALCIUM IN DIET	RATIO OF DIET TO MILK
		μμc.	*gm.*	
San Francisco	March	4.0	5.3	1.32
	August	1.8	3.1	1.72
Chicago	May	6.2	11.1	1.79
	September	5.1	7.6	1.49
New York	March	9.0	11.4	1.27
	June	10.1	12.3	1.22
Average				1.4

*From tri-city study, 1960 (6).

Column 5 of Table 3 shows the ratio of diet to milk strontium varies from 1.22 to 1.79 with an average of 1.4. At levels in milk of 2 to 10 micromicrocuries strontium-90 per gram calcium, the estimation that the diet is 1.5 to 2 times greater appears to be a reasonably satisfactory preliminary estimate for countries whose local milk consumption represents a substantial part of the calcium intake.

Summary and Conclusions

The environment and, consequently, food contains measurable amounts of radionuclides arising primarily from the distribution of nuclear bomb debris over the entire earth's surface. This radioactivity is in addition to natural radioactivity which exists in the environment.

A wealth of information has been gathered on the artificial radioactivity in air, water, vegetation, and soil; on physical and chemical mechanisms of radioactive movement in the biosphere; and on the biologic behavior of radionuclide uptake by animals and human beings and their distribution in excretions and secretions. Collection of additional information under more carefully designed and executed studies is under way. There remains the task of marshalling and reviewing the data obtained during active fallout up to the summer of 1959.

With later information collected during a period of substantially no fallout, the interpretation of these data hopefully will indicate the relative magnitude of physical, chemical, and biologic factors influencing levels in plants and animals, provide a means of predicting future levels, and, most important, permit some evaluation of the effects of nuclear radiation from ingestion of contaminated food as a part of the total effects from fallout and from natural radioactivity.

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The Tide of Quackery Must Be Stopped

Consumers spend more than $1 billion a year "needlessly on falsely represented drugs, foods and cosmetics," according to George P. Larrick, Commissioner of Food and Drugs. In speaking before the National Congress of Medical Quackery on October 6 in Washington, D.C., Mr. Larrick said there are three major kinds of quackery from the standpoint of protecting the public by both law enforcement and education—fake medical devices, pseudo-science in nutrition, and false claims for drugs and cosmetics.

"The most widespread and expensive type of quackery in the United States today," he said, "is in the promotion of vitamin products, special dietary foods, and food supplements. Millions of consumers are being misled concerning their need for such products. Complicating this problem is a vast and growing 'folk-lore' or 'mythology' of nutrition which is being built up by pseudo-scientific literature in books, pamphlets, and periodicals. As a result, millions of people are attempting self-medication for imaginary and real illnesses with a multitude of more or less irrational food items. Food quackery today can only be compared to the patent medicine craze which reached its height in the last century. Especially disturbing is the tendency shown by some big and hitherto respected food concerns to use quackery in their sales material.

"More and more, we are running into what we are sure is rigged research—the study that was set up and written up to support a claim rather than to seek for scientific truth. We have with us today the professional research quack—the M.D. who specializes in arranging for 'tailored studies' of products intended for the over-the-counter market.

Labeling and advertising may also be designed to get around the law. "The label may even be devoid of claims, or they are so stated that expensive studies in advertising psychology or mass communications must be made to determine what ideas and impressions the consumer actually receives from reading this copy.

"Enforcing the law against food faddism and quackery is not easy, particularly because there is so much of it, and so much that is beyond the reach of the law. Unless it constitutes labeling or advertising matter, or can be proved to violate the mail fraud statutes, quackery in print is outside the jurisdiction of any federal statute.

"But if writings in book form, in newspapers, magazines, or other media are used to promote the sale of foods or drugs, we may be able to proceed against the particular food or drug for failure to bear adequate directions for use for the conditions referred to in the writings. In the same manner, we can take action against products that are misrepresented by the spoken word.

"Keeping track of sales arguments used in the privacy of the home by 50,000 door-to-door canvassers is too much for 650 inspectors who also have other duties. And many of these sales agents, like the people who write the label and advertising copy, have learned to be quite careful about how they do their door-bell doctoring. They use carefully contrived suggestions and literally true but misleading statements. They get the customer to prescribe for himself, which he frequently does on the basis of prior indoctrination, by referring to other customers who have had seemingly miraculous results.

"Notwithstanding these difficulties, the Food and Drug Administration has had considerable success in combating food quackery in the courts. There have been some heavy fines and some prison sentences. Three big mail order vitamin companies had their entire stocks impounded by seizure proceedings, while their catalogs and circulars were being purged of false and misleading statements. Such actions have had a marked deterrent effect. Especially significant in my opinion is the success we have had in sustaining misbranding charges against the nutritional 'big lie'—that the American food supply is impoverished and nutritionally deficient.

"The consistent record of cases won has been due in no small degree to the support we have had from nutrition scientists who have been willing to advise and to testify in court, sometimes at personal sacrifice.

"The record of successful court actions against food quackery, although impressive is very small when we consider the total extent of food quackery. This is an area where education is of special importance. It is hard to purvey the truth when so much misinformation is current. We need all the help we can get from nutrition educators at all levels to stem the tide of quackery. Especially do we need to accentuate the *negative,* as well as the positive, in nutrition education. Future consumers need to be taught to beware of nutritional bunk, as well as to learn the fundamentals of good nutrition."

Effect of Bone on Sr-89 and Ca-45 in Beef Roasts[1]

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RADIOACTIVE STRONTIUM is one of the major long half-life products of nuclear fission. Since most of the strontium retained by animals is deposited in bone, it is important to determine if this strontium would be released from the bone in cooking processes.

Methods and Procedure

Sixteen roasts with bone and sixteen boneless roasts were obtained from steers dosed orally with 6 microcuries of strontium-89 and 12 microcuries of calcium-45 in three separate doses over a 140-day experiment. These roasts were obtained from the short loin area. From each roast, one sample each of bone and meat was taken for analysis before cooking. Each roast was wrapped in two layers of heavy aluminum foil and placed in a Pyrex dish in an electric oven preheated to 325°F. When the temperature reached 160°F. in the center of the roast as shown by a meat thermometer, the roast was removed and the drippings drained from the roast. The drippings were evaporated almost to dryness and then ashed at 1200°F. Samples of meat (approximately 100 gm. each) were obtained near the bone and at the farthest point away from bone for comparison with meat from boneless roasts. Samples of bone were taken from the cooked roasts for comparison with uncooked bones. All samples were dried at 212°F. for at least 48 hr., then ashed at 1200°F. The ashed samples were dissolved in 6 N hydrochloric acid and aliquots taken for precipitation of strontium-89 and calcium-45 as the oxalate (1). The samples were counted with and without an aluminum absorber to determine the calcium-45 and strontium-89 content.

Results and Discussion

Cooking losses amounted to 25 per cent for boneless roasts and 19 per cent for those with bone. These figures are comparable with other results for foil wrapped roasts (2). Some of the strontium-89, cal-

[1]This report is published with the permission of the Director, University of Tennessee Agricultural Experiment Station, Knoxville. The radioactive materials used in this work were obtained from the Oak Ridge National Laboratory on allocation from the United States Atomic Energy Commission. The work was completed under contract No. AT-40-1-GEN-242 between the University of Tennessee College of Agriculture and the Atomic Energy Commission. Received for publication January 11, 1961.

TABLE 1 **Strontium-89, stable calcium, and calcium-45 in beef loin roasts**

SAMPLE	STRONTIUM-89				CALCIUM		CALCIUM-45			
	Counts/min.		% dose X 10^{-6}		Mg./kg. meat	Mg./gm. bone	Counts/min.		% dose X 10^{-6}	
	Per kg. meat	Per gm. bone	Per kg. meat	Per gm. bone			Per kg. meat	Per gm. bone	Per kg. meat	Per gm. bone
Boneless roasts										
Meat	205±48*	—	369±86	—	73± 7	—	621±121	—	176± 29	—
Drippings	120±17	—	216±31	—	71± 7	—	765± 85	—	217± 20	—
Roasts with bone										
Near bone	936±108	—	1685±194	—	256±22	—	3905±549	—	1106±157	—
Away from bone	166±57	—	299±103	—	74± 6	—	836±162	—	237± 42	—
Drippings	276±40	—	497± 72	—	116±16	—	1201±159	—	340± 43	—
Meat uncooked	189±41	—	340± 74	—	—	—	610± 59	—	173± 15	—
Bone										
Uncooked	—	323±23	—	581±79	—	96±5	—	1912±121	—	542±62
After cooking	—	386±40	—	695±72	—	121±4	—	542± 62	—	511±38

*Standard error of mean.

cium-45, and stable calcium moved from the bone to the meat when the roasts were cooked with bone attached (Table 1). Radioactivity in the meat, however, was low for all samples. The concentration was greater near the bone than in samples taken farthest from bone. Meat from cooked boneless roasts showed essentially the same concentration of radioactivity as uncooked meat samples taken from the same area. There was on the average 1.7 $\times$ 10^3 and 3.1 $\times$ 10^3 more strontium-89 and calcium-45, respectively, in the bone as compared with the uncooked meat. The radioactivity in the bone sample from vertebrae was not appreciably affected by cooking. Of the original doses of radioactivity, little remained in the meat. Bartley and Reber reported (3) no transfer of radiostrontium between the bone and meat of hams from orally dosed pigs. They indicated that the increase of radiostrontium on cooking was due to a loss of fat and moisture.

After cooking, there was more strontium-89 and calcium-45 in the juice or drippings from the roasts with bone. Here, again, the amount was small but measurable. Similar results have been reported in that radiostrontium passed into the broth in cooking of fish and poultry (4). These results are in contrast with those reported by Bartley and Reber (3), who found no movement of radiostrontium into the cooking juices from hams.

Summary

Loin roasts with and without bone from carcasses of sixteen beef steers previously dosed orally with strontium-89 and calcium-45 were used in this study. After cooking, meat from roasts containing bone revealed a higher content of strontium-89, calcium-45, and stable calcium. The concentration of activity varied inversely with distance from bone. The drippings from the roasts with bone contained more strontium-89 and calcium-45 than did drippings from boneless roasts.

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The A.M.A. Fights Quackery

The American Medical Association has maintained files of information on what we like to regard as the seamy side of medicine for more than fifty years. The files and records have been maintained and catalogued carefully by a most capable and devoted staff, and these are quickly available, not only for the purposes of answering inquiries, but for the use of such federal agencies as the Food and Drug Administration; the Post Office Department; the Federal Trade Commission; the Justice Department, mainly in the person of the Federal Bureau of Investigation; the Department of State, mainly in the person of those engaged in investigating individuals subject to the immigration laws; and last but not least, the Internal Revenue Department in its interest in questionable practices, so far as income-tax returns are concerned.

The interests of persons inquiring have, as might be appreciated, modified as time goes on. Whereas, in 1920, the Department might have handled many inquiries on nostrums for the cure of diabetes, today, in the period of a year, it receives only four or five. The same is true of nostrums or methods for the cure or alleviation of such conditions as tuberculosis, venereal disease, and diphtheria. Nowadays cancer cures constitute the largest single category having the interest of the families and friends of cancer victims, physicians affected by patient- or family-pressure, government agencies, and others interested in this dirty business. Dr. Morris Fishbein once remarked editorially in the *Journal of the American Medical Association* that "Of all the ghouls who feed on the bodies of the dying, the cancer quacks are the most vicious and the most heartless."

The American Medical Association seeks to expand its function as a nerve center for information on these many aspects of the seamy side of medicine. Many states, both the medical societies and the state licensing boards, rely upon information from our Department. We would like to widen this highway of information, because people who pretend to medical skill, or doctors of questionable ethics, are not apt to improve their behavior as they move from place to place.

The Food and Drug Administration, the Post Office Department, the Federal Trade Commission, and the food and drug groups of many states cannot do the job alone. It takes a program which seeks to acquaint the public with the problem, and swings into action quickly when there is a threat to the community or to the nation at large. This takes the help of all interested people —consumer groups, educational groups, religious organizations, and most of all, those responsible for the education of the American youth. We have made a start. Let us recognize our responsibilities and let's not be taken in ourselves.

It was Voltaire who said that the quack was born when the first knave met the first fool. For years now the Propaganda Department and now the Department of Investigation has believed that Voltaire was only partly correct. The emphasis should be on letting the public know, strengthening the laws where necessary, but most of all, providing a means of distinguishing between the legitimate medical practitioner and the one who pretends to be one.—*Oliver Field, Director, Department of Investigation, American Medical Association, speaking before the National Congress on Medical Quackery in Washington, D.C., on October 6, 1961.*

Two Dietary Survey Methods Compared

Diets of Pregnant Women in Kauai, Hawaii[1]

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When a simple, quick method of estimating dietary intake is indicated, it is suggested that one may be developed to suit the situation on the basis of a preliminary study done by accepted techniques.

AS A PART of the Kauai Pregnancy Study (an investigation conducted on the island of Kauai, Hawaii, to explore the "underlying causal factors" responsible for unfavorable outcome of pregnancy), a dietary survey was made in the summer of 1956 of a sample of women in the Study. The purpose of this survey was twofold: (a) to obtain as accurate a picture as possible in the few months available of the probable nutritional adequacy of the diets; (b) to test the reliability of the method of collecting dietary data being used in the Study.

This report will summarize the procedure and findings of the 1956 dietary survey (to be referred to as the "Special Dietary Survey") and make a brief comparison between the results obtained in the Special Dietary Survey and those collected by the method used in the Kauai Pregnancy Study (designated by the word "gross").

The Special Dietary Survey

METHOD USED

Pregnant women included in the Special Dietary Survey included all women first interviewed by the regular staff of the Kauai Pregnancy Study during May and June, 1956. Of these seventy-one, four were discarded from the Survey—one because she had a fetal loss before the special interview, two because data obtained were obviously unreliable, and one had moved. At the time of the Special Dietary Survey interview, forty-four women were in the second trimester of pregnancy, twenty-one in the third, and two in the first. All had passed the early stage of pregnancy in which some women experience eating difficulties. They represented various ethnic backgrounds: Japanese, Filipino, Caucasian, Chinese, Korean, and Hawaiian, with the Japanese representing the largest single group. As one might expect with such variety in heredity, the women ranged in body size and physique from the petite Japanese woman to the statuesque Hawaiian. The reported prepregnancy weight for the sample group ranged from 39 to 83 kg. with a mean of 53.7 kg., approximately 4 kg. less than that of the reference woman used in the 1958 revision of the National Research Council's Recommended Dietary Allowances (2).

Women were visited in their own homes and questioned in detail regarding their food intake for the past 24 hr., and then for the remainder of the preceding week. It was interesting that some women were able to recall their food intake for each day of an entire week simply by relating their food to their major activity for the day. In most cases, however, the memory of food consumed during the early part of the week had grown dim, so that considerable prodding and detailed inquiry regarding the entire week's happenings were needed to reconstruct the dietary picture. In some cases, four days constituted the maximum period for which specific meals could be recalled. Food lists were then used as a memory aid to both client and interviewer, and inquiry was made into family food purchases.

In addition to jogging the memory, food purchases helped define amounts consumed. In the case of meat, for example, amounts consumed in "mixed" dishes might easily have been overestimated had purchases not been investigated. The measuring cups and spoons carried by interviewers were a further aid in quantitative assessment of probable food intake. Thus, by patient questioning and serious cooperation by the subject, a fairly clear picture

[1]Received for publication May 22, 1961.

of the probable food intake for a week could be procured. Finally, an attempt was made through further discussion to determine whether the week discussed was typical for at least the immediate past month of pregnancy. In cases where it was not, a serious attempt was made by using previously mentioned techniques to obtain detailed information regarding the food intake of previous weeks so that the final dietary recorded could be said to represent a "typical" average daily intake for the past month.

Obviously, this method of obtaining the dietary was neither easy nor quick. The usual interview required an hour to an hour and a half of hard work on the part of both interviewee and interviewer. Even so, omissions and errors doubtless occurred. As indicated by the voluminous literature on dietary survey methodology, there is as yet no satisfactory method of obtaining a completely valid picture of the "typical" food intake of subjects living in their own homes on self-chosen diets. Close observation and accurate recording of food intake, in addition to being extremely time-consuming, have the further disadvantage of possibly influencing a subject's food intake.

The method used in the Special Dietary Survey was chosen, not because it was considered perfect, but because it seemed the best that could be employed under the circumstances. A detailed dietary history, conducted by an experienced interviewer so as to obtain quantitative as well as qualitative data, has indeed been acceptably employed in countless surveys and, despite the recognized weaknesses inherent in retrospective histories, constitutes the method of choice of many workers, particularly when, as in this case, dietary records are impractical (3). It was felt, therefore, that it might suffice to give fairly valid information about the current dietary intake of the women and also constitute a suitable yardstick against which to measure the shorter, simpler, "gross" method used in the Kauai Pregnancy Study.

Forty-two of the sixty-seven interviews were done by the senior author and the remaining twenty-five by a trained home economist who was a resident of Kauai and so was familiar with the foods and eating practices of the island. At the outset, the interviewers visited homes together and listened to each other's interviews in order to insure, insofar as possible, uniformity of technique. They continued to check each other's calculations of food quantities and nutrient intakes throughout the Survey.

The average daily food intake for each woman was calculated for protein, calcium, vitamin A, ascorbic acid, thiamine, riboflavin, and iron content. Values reported in standard food tables (4-7) were used.[2]

[2]For ease of calculation, these values, per estimated 100-gm. portion of food, were rounded as follows: for protein, to the nearest gram; for vitamin A, to the nearest multiple of 100 for values under 2000 I.U. and to the nearest multiple of 500 for values over 2000 I.U.; for ascorbic acid, to the nearest multiple of 5 mg.; for iron, to the nearest milligram; for thiamine and riboflavin, to the nearest multiple of 10 mcg.; and for calcium, to the nearest multiple of 10 mg.

FINDINGS OF SPECIAL DIETARY SURVEY

Foods. Perhaps the most interesting finding was the wide variety of foods and dishes included in the diets of the women surveyed. In addition to typical "Mainland" foods, there were Japanese, Chinese, Hawaiian, Portuguese, Filipino, and Italian dishes, used not only by women with these national backgrounds, but by others as well. Thus, the "typical" diet represented a mixture of various cultural patterns and might include peanut butter sandwiches, "tofu" (soybean curd), "sukiyaki" (Japanese beef and vegetable dish), "poi" (Hawaiian taro root preparation), Italian spaghetti, "gabo" (dried shrimp), "kimchi" (pickled cabbage), Portuguese sausage, steak, milk, papaya, and New England clam chowder—a truly international cuisine. That this delightful variety made surveying more complicated cannot, however, be denied.

The frequency with which individual foods were used and the amounts consumed varied considerably among women.

Fruits and Vegetables. Average daily consumption of fruits and vegetables is shown in Table 1. The two fruits eaten by the greatest number of women were papaya and fresh tomatoes or tomato juice, 44 and 46 women, respectively; 32, or approximately half of the women, consumed fresh oranges or orange juice, while 7 used canned or frozen juice. Several women drank an orange-flavored beverage, apparently thinking of it as orange juice. Mangoes, in their relatively short season at the time of the survey, were reported by 30, and pineapple by 24. Other commonly used fruits were bananas, listed by 27 women, and guava nectar or juice, reported by 17.[3]

Although over-all consumption of vegetables was less than that of fruit, a wide variety occurred. Over one-third of the women reported eating green beans, carrots, cooked cabbage, potatoes, and various types of lettuce. Other commonly used vegetable dishes were watercress, either raw or cooked; eggplant; green and cooked onions; peas; tomato sauce; cucumbers; corn; kidney beans; canned vegetable soup; raw cabbage; celery; and poi. Not infrequently less well known items, such as "marong-

[3]A wide variety of various other fruits, listed in order of decreasing frequency, occurred in the diets of from twelve to one of the women: apples, lilikoi or passion fruit, watermelon, avocado, plums, grapefruit, fresh peaches, apricot nectar, grape nectar, canned pears, peach nectar, canned peaches, canned fruit cocktail, prunes, fresh cherries, mountain apples, grapes, nectarines, and canned apricots. While some of these, such as avocado, passion fruit, and mountain apples, were locally grown, most were imported from the Mainland.

gay" (horseradish tree leaflets and tender tips), taro, bean sprouts, Chinese cabbage, bamboo shoots, "takuan" (pickled vegetable), and others were mentioned—an indication of the mixed cultural origin of dietary practices on the island.

Milk. The frequently recommended "quart of milk a day for pregnancy" was reported by only 6 of the 67 women, while 13 used less than ½ cup a day or none. Most of the milk consumed was in fresh fluid form, although almost all women used small amounts of evaporated milk in their coffee and two used dried skim milk. Additional dairy products used were ice cream, by 30 of the 67 women, and cheese by 7.

Meat and Other Protein-Rich Foods. No meatless diets were reported, and most women ate a variety of meats, fish, and poultry. Sixty-one of the 67 ate beef, 50 pork "meat," 10 bacon, and 11 mentioned luncheon meat and sausages probably made of mixtures of pork and veal; 38 reported fish (fresh or frozen), 15 used canned tuna, 6 used pickled or "lomilomi" salmon, and 4 ate dried or fresh shrimp. Chicken was frequently used, occurring in 25 of the diets. Seven women ate liver. Size of meat portions was often small—1 oz. or less—especially in the mixed meat and vegetable dishes previously mentioned. In addition to meat and dairy products as sources of animal protein, eggs were used by 57 women. Vegetable protein-rich foods included soybean curd or "tofu," reported by 18 of the women; peanut butter, used by 8; soybeans, either green or mature, mentioned by 4; and Filipino, navy, or kidney beans, which appeared in 21 diets. Of interest is the finding that, despite the variety of protein-rich foods used, on the average about a third of the protein was derived from breads, cereals, vegetables and fruits.[4] Thus, foods not ordinarily considered protein-rich did make a major contribution to the total protein intake.

TABLE 1 Average daily fruit and vegetable consumption for 67 pregnant Kauai women—Special Dietary Survey, June-July, 1956

NUMBER OF 100-GM.* PORTIONS	NUMBER OF WOMEN
Fruits	
Less than one	9
One	20
Two	14
Three or more	24
Total	67
Vegetables	
Less than one	12
One	40
Two or more	15
Total	67

*Approximately.

Cereal Products. The most commonly used cereal product was white rice, which appeared in all diets but two. In only three instances was the rice known to be fortified. Enriched white bread was used in 59 of the 67 diets, and whole wheat bread in 3. Twenty-three women used spaghetti or other pastas, and 34 ate "sweet breads," such as doughnuts, sweet rolls, pancakes, cookies, or cake. Breakfast cereals were reported by 29 women, of whom 16 reported oatmeal.

Sweets.[5] Although "sweet breads" and other "sweets"—jellies and jams, soft drinks, fruit nectars, candy, puddings, pie, ice cream—were

[4]The range was from 6 to 67 per cent of individual protein intakes, with a mean of 32 and a standard deviation of 14 per cent; grams of protein from these sources ranged from 2 to 40, with a mean and standard deviation of 19.5±8.1 gm.

[5]The following values were used in calculating sugar intake: sweet drinks (soda pop, Coca Cola, nectars, lilikoi juice, guava juice, lemonade, and so on), 10 per cent sugar by weight; ice cream and puddings, 20 per cent; sirup, jam, jelly, 100 per cent; cakes, pies, doughnuts, sweet rolls, and so on, 50 per cent.

TABLE 2 Range and selected percentile values of average daily nutrient intake of 67 pregnant Kauai women

NUTRIENT	RANGE OF INTAKE	PERCENTILES* OF NUTRIENT INTAKE					
		2.5th	16th	50th (median)		84th	97.5th
Protein							
Total intake (gm.)	29 — 100	30	43	*64*	(78)†	81	96
From protein-rich foods (gm.)	12 — 82	19	25	*42*		60	75
Gm. intake/kg.‡	0.5 — 2.3	0.5	0.8	*1.1*	(1.3)	1.7	2.0
Calcium (gm.)	0.21— 1.53	0.22	0.33	*0.73*	(1.5)	1.12	1.38
Iron (mg.)	4 — 17	5	6	*9*	(15)	11	14
Vitamin A (I.U.)	1,733 —48,345	1,910	4,093	*6,230*	(6,000)	11,330	27,390
Thiamine (mg.)	0.3 — 1.9	0.3	0.7	*0.9*	(1.3)	1.3	1.6
Riboflavin (mg.)	0.4 — 4.5	0.5	1.0	*1.5*	(2.0)	2.0	2.6
Ascorbic acid (mg.)	19 — 308	20	47	*88*	(100)	160	247

*Percentiles have been used rather than delineations based on means and standard deviations because of skewed distributions for some nutrients, particularly vitamin A, ascorbic acid, and riboflavin.

†Values in parentheses are the Recommended Dietary Allowances of 1958 (2).

‡Grams total protein per kilogram of prepregnancy weight.

used, the amount did not appear to be excessive, as indicated by the roughly calculated sugar consumption. Thirty women probably averaged less than 40 gm. of sugar daily, 26 averaged roughly from 40 to 79 gm., and only 11 appeared to consume 80 or more grams. Since most of the women had been told by their physicians to "watch their weight," they may have been curtailing their intake of "sweets."

NUTRITIVE VALUE OF DIETS

The median daily intake of nutrients for the women in this survey appear as the italicized figures in Table 2, Column 5. The median for vitamin A exceeds, and for ascorbic acid and protein is between 80 and 90 per cent of the generous dietary allowances recommended for pregnant women by the National Research Council. Thiamine and riboflavin roughly equalled three-fourths, iron approximately two-thirds, and calcium about a half of the suggested levels. Quality of the protein, moreover, seems assured, since approximately two-thirds was primarily of animal origin. In addition to the median figures, one must, however, consider the variation in intake from woman to woman as shown by the lowest and highest values observed as well as the percentile values tabled. It then becomes apparent that the diets of a number of these women fell far short of recommended intake levels. As indicated in Table 3, only in vitamin A and ascorbic acid did as many as approximately half of the women meet the recommended allowances. Almost a third, on the other hand, fell into the lowest intake category for calcium and iron, and from one-sixth to one-seventh had low intakes of protein (calculated on a per-kilogram basis), thiamine, riboflavin, and ascorbic acid.

It would seem that one might well be concerned about the women in the lowest intake category of each nutrient, especially if these intakes were to persist over a period of time. (Upper limits for these low categories were arbitrarily set at approximately half of the Recommended Dietary Allowances, levels which might, in the opinion of the senior investigator, more nearly approximate actual requirements; the highest categories met or exceeded these allowances. As indicated in a footnote to Table 3, slightly higher limits were set for protein per kilogram of body weight and slightly lower limits for calcium.) Doubtless some of these low intakes were due to inadequate management of caloric restriction, since many of the women were "trying to watch their weight."

Fortunately, in the case of some nutrients, the

TABLE 3 Women with specified average daily nutrient intake as determined by Special Dietary Survey

NUTRIENT	NUTRIENT INTAKE LEVEL		
	Less than 50% of recommended allowance (2)	50 to 99% of recommended allowance (2)	100% or more of recommended allowance
Protein			
Total intake			
Range of intake (gm.)	29 — 38	39 — 77	78 — 100
Number of women	6	44	17
Gm. intake per kg.†			
Range of intake	0.50— 0.75*	0.76 — 1.49	1.50*— 2.30
Number of women	10	41	16
Calcium			
Range of intake (gm.)	0.20— 0.49	0.50*— 1.49	1.50 — 1.53
Number of women	18 (8)‡	48	1
Iron			
Range of intake (mg.)	4 — 7	8 — 14	15 — 17
Number of women	23 (10)	42	2
Vitamin A			
Range of intake (I.U.)	1,733 —2,999	3,000 —5,999	6,000 —48,345
Number of women	4 (2)	25	38
Thiamine			
Range of intake (mg.)	0.3 — 0.6	0.7 — 1.2	1.3 — 1.9
Number of women	9 (3)	46	12
Riboflavin			
Range of intake (mg.)	0.4 — 0.9	1.0 — 1.9	2.0 — 4.5
Number of women	8 (2)	46	13
Ascorbic acid			
Range of intake (mg.)	19 — 49	50 — 99	100 — 308
Number of women	12 (5)	25	30

*The values of 0.75 gm. and 1.50 gm. per kilogram of prepregnancy body weight as the upper limit for the lowest intake level and the lower limit for the highest intake level respectively are slightly higher than 50 and 100 per cent of these allowances. The calcium value of 0.5 gm. is one-third of the recommended allowance.

†Grams per kilogram of prepregnancy body weight.

‡Numbers in parentheses refer to number of women remaining in lowest category, assuming that prescribed pharmaceutical supplements were taken.

vitamin-mineral supplements[6] prescribed by physicians for about half of the women augmented the dietary intake. Assuming that the supplements were taken, one can (Table 3, Column 2) remove from the lowest categories all but 10 of the iron, 8 of the calcium, 5 of the ascorbic acid, 2 of the vitamin A and riboflavin, and 3 of thiamine intakes. Low protein intakes were, of course, not relieved by such supplementation. Interestingly, the 10 women with the lowest protein intake (per kilogram of prepregnancy weight) also fell into the lowest categories for an average of 3.1 other nutrients.

On the basis of food intake alone, exclusive of pharmaceutical supplementation, 24 of the 67 women, about one-third, were not in the lowest category for any nutrient calculated. Twenty were low in one, 12 in two, and 11 in three or more groups. Diets of these 11 were, of course, particularly low in protective foods and relatively high in refined carbohydrate-rich foods, such as unenriched, polished rice. Taking into account pharmaceutical supplementation, 38 would probably be low in none of the nutrients considered, 19 in one, 7 in two, and only 3 in three or more nutrients. Whether a low intake of several nutrients is indeed more serious than a single lack cannot, on the basis of present nutritional knowledge, be definitely stated. Furthermore, we cannot say with assurance that our definition of low is equally critical for all nutrients from a physiologic point of view.

Another factor of nutritional interest was the high sodium content of most, if not all, of the diets. Doubtless due to the Oriental influence, soy sauce and other condiments containing large quantities of sodium glutamate and sodium chloride were freely used. Efforts to estimate amounts used proved futile, largely because of the custom of marinating foods in a salty sauce and then discarding part of the marinade.

DISCUSSION OF DIETARY FINDINGS

It is apparent that despite the wide variety of foods in use and the generally satisfactory average dietary intake, there was, nevertheless, a group of women whose diets definitely needed improvement. While dietary supplementation did in some cases take care of certain nutrient lacks, others, such as protein, can be satisfactorily met only by food. Protein-rich food would obviously also take care of low intakes of nutrients in addition to protein, such as the B-vitamins, possibly iron, and perhaps calcium.

[6]It is interesting that among these sixty-seven women, vitamin-mineral supplementation appears not to have been based on the dietary intake of vitamins and minerals. Supplements were prescribed not only for half of those in the low-intake groups for each of the nutrients, but for about half of those in the medium and high groups as well.

How did low protein intakes occur? While this study made no attempt to discover underlying economic or social reasons for the existing food practices, the dietary data do reveal the following as factors associated with low protein intake: illness; inadequate management of reducing diets or too-severe caloric restriction; dislike for milk as a beverage; small portions of protein-rich food, consumed usually as part of a "mixed" dish and not accompanied by dairy products or sufficient amount of cereal products.

The few low intakes of ascorbic acid were associated with small portions of fruit and/or vegetable and usually varieties not particularly rich in ascorbic acid. In one case, the husband's ulcer diet, which the wife shared, was responsible.

The low-milk, no-egg, low-carotene diets were those low in vitamin A.

Thus it is readily apparent that caloric restriction, self-imposed or prescribed, merits special dietary consideration. Also, in any dietary, failure to include rich sources of specific nutrients necessitates consumption of large amounts of less rich sources. While these facts appear obvious when delineated, their application appears to merit continued emphasis.

Evaluation of the Gross Survey Method

The Special Dietary Survey emphasized the need for the continuance of dietary investigations in studies dealing with pregnant women, since even in an apparently well-fed community such as Kauai, by no means all pregnancy diets met even half of Recommended Dietary Allowances. As previously indicated, this dietary study was relatively time-consuming and laborious. If quicker and easier methods could be devised for obtaining adequate, reliable dietary information, diet would doubtless receive more ready attention both in investigative studies and in clinical practice. Such methods are, in fact, receiving much consideration at present (8-10). In the interests of methodology, therefore, the "gross" method employed by the Kauai Pregnancy Study merits reporting, even though it was unfortunately shown to be short of satisfactory in many respects.

THE KAUAI PREGNANCY STUDY GROSS METHOD

The Kauai Pregnancy Study was designed to explore many factors which might have an effect on the outcome of pregnancy with the hope of finding new "leads" as to the causes of abnormal obstetric conditions, prematurity, fetal and neonatal mortality, and congenital defects. Numerous fields in addition to nutrition were included (11). Emphasis was on the over-all picture of circumstances surrounding every pregnancy occurring in an entire community. This being the case, a long, intensive dietary inter-

view and detailed calculation of nutrients would not have been feasible or consistent with the basic methodology of the study. Accordingly, only the following items pertaining directly to food intake were included in the interview form: the "typical" daily food pattern, the number of glasses of milk drunk daily, and an estimate of the intake of each of seven food groups, viz., protein-rich foods; foods high in ascorbic acid; vitamin A-rich foods (including those rich in carotene); other fruits and vegetables; enriched or fortified or whole grain cereals, bread, and rice; non-enriched flour and cereal products; and soda pop, candy, jellies, jams, and other sweets. On the basis of information derived from discussion of the typical food pattern and the usual consumption of specific foods, interviewers recorded their estimate of the intake of the seven food groups in terms of a value judgment of "low," "medium," or "high." Salt intake was similarly evaluated.

At the outset and at subsequent intervals, interviewers discussed with each other in training sessions their concepts of these levels, in an effort to achieve uniform reporting. In the case of the protein-rich, vitamin A-rich, and ascorbic acid-rich groups, interviewers tried to base these judgments on the current Recommended Dietary Allowances (12). Since interviewers were nurses or social workers who had supposedly had previous experience with dietary evaluation in their regular work and were acquainted with food practices of the Hawaiian Islands, it was hoped that they had already developed at least some concept of food combinations that might meet these allowances. Their interpretation of "high" was agreed to be any food intake likely to meet or exceed these allowances, "low" any combination of foods that would fail to meet 50 per cent of these recommendations, and "medium" any intakes between these two extremes. The meaning of "low," "medium," and "high" in reference to the remaining food groups appears to have been less well defined and to have had no particular reference to specific nutrients. This method of evaluation, admittedly crude and non-objective, is, in effect, frequently used in clinical work. It was hoped that it might suffice at least to identify extremes of intake.

Devising the method and training the interviewers had been the responsibility of the regular Kauai Pregnancy Study staff, which did not include a nutritionist or other person experienced in dietary survey work. Nine interviewers, seven nurses, and two women experienced in social work performed the "gross" interviews with which the Special Dietary Survey interviews were compared.

Subjects were interviewed in their homes two or three times, depending on how early their pregnancy was known to the Study. Three ratings were recorded—one for each trimester of pregnancy.

COMPARISONS WITH SPECIAL DIETARY SURVEY RATINGS

Because the staff and interviewers of the Kauai Pregnancy Study were uncertain about the validity of their dietary data, a nutritionist was employed to determine by whatever method possible in the few months available to her for this purpose whether the "gross" method did indeed suffice to identify gross differences in dietary intake.

Although the plan was to interview all women in the Special Dietary Survey within a month from the time of their first "gross" interview, so as to cover approximately the same time period and thereby avoid possible dietary variations related to seasonal change and the progress of pregnancy, this was not achieved in all cases. All women were interviewed in June or July, 1956. In some instances, a second Kauai Pregnancy Study interview had been made by this date. For comparison of dietary data, recordings were used from the "gross" method for the trimester in which the Special Dietary interview was made.

Milk Intake. Since both approaches included questions about the amount of milk consumed daily, an outright comparison of findings in regard to this food was possible. As seen by adding the italicized figures in Table 4, a total of 20 of the 66 comparisons agreed within 1 cup or less, and 34 more agreed

TABLE 4 Comparison of average daily intake of specified amounts of milk as assessed by the gross method and Special Dietary Survey

AMOUNT* REPORTED BY SPECIAL DIETARY INTERVIEWS	NUMBER OF WOMEN CLASSIFIED BY GROSS METHOD							TOTAL NUMBER OF WOMEN
	Less than 0.5 cup	0.5—1.4 cups	1.5—2.4 cups	2.5—3.4 cups	3.5—4.4 cups	4.5—5.4 cups	5.5—6.4 cups	
Less than 0.5 cups	*5*†	3	4		1			13
0.5—1.4 cups	4	*4*	8					16
1.5—2.4 cups	3	5	*2*	4	1			15
2.5—3.4 cups		1	5	*7*	2		1	16
3.5—4.4 cups		1		2	*2*	1		6
Total	12	14	19	13	6	1	1	66‡

*Includes some milk used in combination with other foods.
†Italicized figures indicate same classification by both methods, i.e., comparisons that agreed within 1 cup or less.
‡Milk consumption not recorded for one woman by gross method.

within 2 cups. Thus, 82 per cent of the milk estimates by the gross method were comparable to those obtained by the more refined method within a 2-cup range.

In assessing the ability of the gross method to identify low intakes of milk—for example, less than 0.5 cup per day—it was found that only 5 of the 13 so identified by the Special Survey were also called low by the gross method—less than 40 per cent. In addition, of the 53 non-lows identified by the Special Survey, 7 or 13 per cent erroneously were called low by the gross method. If low intake were considered to be less than 1.5 cups per day, the situation is somewhat improved. The gross method correctly identified 55 per cent of the lows but at the expense of relatively more false low assessments, 10, or 27 per cent.

Food Groups or Nutrients. Comparison of "low," "medium," and "high" intake ratings of the gross method with findings of the Special Dietary Survey was possible for six food groups or nutrients. Arbitrary limits, indicated in Tables 3 and 5, were assigned to Special Survey findings to form a basis for comparison with "low," "medium," and "high" ratings by the gross method.

The extent of disagreement between the ratings was great, ranging from 49.3 to 80.3 per cent (Table 5, Column 4). For the protein comparisons, the gross method's ratings tended to be higher than those of the Special Survey; the ratio of errors on the high side to those on the low side being three to one. On the other hand, for enriched breads and cereals and for sweets, gross method ratings were on the low side: the ratio of errors on the low side to those on the high side were roughly five to one and three to one, respectively. For the remaining, about as many ratings were too high as too low.

With reference to the ability of the gross method to identify women with low intake of the various nutrients, the number of lows missed ranged from 27 per cent for sweets to 80 per cent for protein (grams protein per kilogram of prepregnancy weight, Table 6, Column 6). The test of the method, of course, also depends on how many non-lows were erroneously called low.[7] As seen in Column 8, wherever the gross method had the least poor record with respect to identifying low ratings, there we find the largest relative number of incorrectly designated lows. The poor record for protein is consistent with the apparent tendency for gross method assessment to be on the high side as pointed out above; this tendency also probably accounts for the relatively few errors among the non-lows. Similarly, the general tendency to rate enriched breads and cereals, and sweets, on the low side resulted in more of them being identified, but at the expense of many false lows.

DISCUSSION AND CONCLUSIONS

While attempts to explain discrepancies between findings of the two methods lie largely in the field of conjecture, several factors seem likely to have played a part. In the direct comparisons by the two methods of foods and food groups, viz., milk, bread, and cereal products, the careful attempt in the Special Dietary Survey to quantitate amounts consumed by inquiring not only into number and size of portions consumed but also into family food purchases was doubtless responsible for the achieve-

[7]For example, the gross method could indentify all lows by rating every diet low; but as a result, 100 per cent of the non-lows would be in error.

TABLE 5 Number of ratings of dietary intake which were lower or higher by gross method than ratings by Special Dietary Survey

NUTRIENT OR FOOD GROUP	TOTAL COMPARISONS*	TOTAL DISAGREEMENTS		GROSS METHOD LOWER		GROSS METHOD HIGHER	
		Number	Per cent	By one rating	By two ratings	By one rating	By two ratings
Protein							
Total intake	67†	40	59.7	9	1	30‡	0
Gm. intake per kg.	67†	41	61.2	19	0	28	3
Non-enriched breads and cereals	67†	37	55.2	17	1	13	6
Ascorbic acid	67	33	49.3	18	0	13	2
Vitamin A	67†	39	58.2	22	2	15	0
Enriched breads and cereals‡	66	53	80.3	29	15	9	0
Sweets‡	66†	33	50.0	22	2	7	2
Total	467	276	59.1	127	21	115	13

*Comparisons based on low, medium, and high ratings recorded in gross method and as defined by Special Dietary Survey. Categories for the Special Dietary Survey were defined in Table 3 except for the following: *Sweets* (gm. sugar)—low, under 40; medium, 40 to 79; high, 80 or more; *Non-enriched breads and cereals* (servings)—low, none to 1; medium, 2 to 3; high, 4 or more; *Enriched breads and cereals* (servings)—low, none to 1; medium, 2 to 3; high, 4 or more.

†Includes 1 or 2 gross method reports listed as "low to medium" and/or "medium to high", which were considered to be in agreement with ratings of Special Dietary Survey.

‡Ratings for sweets and enriched breads and cereals were not recorded for one woman by the gross method.

ment of greater accuracy. In the case of protein-, vitamin A-, and ascorbic acid-rich foods, where it seemed justifiable to make comparison between the two methods in terms of nutrients because the gross method interviewers supposedly had a nutrient standard in mind in making their assessments, errors by the gross method may have occurred either at the point of estimating kinds and amounts of foods rich in these nutrients or in the translation into nutrients. Both steps are difficult in a diet as complex and varied as that in Kauai. Vitamin A affords one example of such difficulty. It is derived from a variety of foods with a wide range of values, particularly in the case of the pro-vitamin, carotene. Even a relatively small error in estimating the amount of a carotene-rich food could account for a discrepancy of several thousand units of vitamin A equivalent.

Doubtless interviewers' standards were influenced by community practices, e.g., the tendency for protein ratings by the gross method to average higher than those by the Special Dietary Survey may have been due at least in part to a tendency of the local Kauai interviewers to consider as usual or "medium" the relatively small amounts of protein-rich food frequently used in mixed dishes. On the other hand, the underestimation of unenriched cereals may have occurred because of the practice of eating portions of rice that were large in Mainland United States terms.

In some instances, actual changes in diet may have occurred between the time of the two interviews, despite attempts to cover the same time period.

Misrepresentation by interviewees may have occurred, unwittingly or otherwise.

A further observation, difficult to assess objectively but nevertheless apparent, was that interviewers using the "gross" method were not satisfied with it. Because they recognized its incompleteness and lack of precision, they could not use it with confidence and enthusiasm. Thus the human factor may have further jeopardized both the validity and reliability of the method. It would seem that a method, to be used effectively, must be well defined, adequate for its purpose, and well understood.

The "hindsight" provided by the comparison of the two dietary survey methods suggests that in future studies, a detailed survey by accepted methodology of a small, representative sub-sample of subjects precede an attempt to formulate a quicker and easier method of assessing dietary intake. A preliminary study, such as the Special Dietary Survey reported here, can give a preview of the complexity and diversity of dietary patterns and of the most likely dietary problems. Procedure from this point will depend on the findings of the preliminary study. In Kauai, for example, the complexity of the diet would preclude an easy assessment of the dietary intake of nutrients derived from multiple food sources, such as iron, even though the diets of many women were low in this essential. Obviously, non-dietary sources could and should be investigated. On the other hand, since ascorbic acid was derived largely from a relatively small number of ascorbic acid-rich fruits, it should be possible to structure a small number of questions that, properly used, could assure a relatively reliable estimate of the quantitative intake of these foods which, in turn, could be used in arriving at the probable ascorbic acid intake. Since milk was consumed largely as a beverage, usual intake[8] could be quite

[8]In this study, if we had used an average daily consumption of milk of less than 1 cup as a key to low-calcium intake, we would have correctly identified 16 of the 18 diets rated low for calcium; also included as low would have been two diets with no milk reported but with other milk products which put them into the medium-calcium group.

TABLE 6 Ability of the gross method to identify low intake of nutrients as determined by the Special Dietary Survey

NUTRIENT OR FOOD GROUP	TOTAL COMPARISONS	NUMBER OF LOW RATINGS*		LOW INTAKES MISSED BY GROSS METHOD		NON-LOWS CALLED LOW BY GROSS METHOD	
		Special Dietary interview	Gross method	Number	Per cent	Number	Per cent
Protein							
Total intake	67†	6	6	4	66.7	4	6.6
From protein-high foods	67†	10	6	8	80.0	4	7.0
Gm. intake per kg.‡	67†	10	6	8	80.0	4	7.0
Non-enriched breads and cereals	67†	22	12	15	68.2	5	11.1
Ascorbic acid	67	12	9	8	66.7	5	9.1
Vitamin A	67†	4	5	3	75.0	4	6.3
Enriched breads and cereals#	66†	13	40	6	46.2	33	62.3
Sweets	66	30	40	8	26.7	18	50.0

*For definitions of low categories used in Special Dietary interview, see Table 3 and footnote (*) of Table 5.
†See footnote (†) of Table 5.
‡Grams total protein per kilogram prepregnancy weight.
#Sweets and enriched breads and cereals were not recorded for one woman by gross method.

readily assessed, particularly if inquiry were made into food purchases, and serve as an answer to the question of probable dietary calcium intake and as a partial answer to intake of protein and other nutrients. The major effort should probably be directed toward obtaining information regarding the quantitative intake of protein-rich foods, partly because the amount of these foods spelled the difference between an adequate and low intake of not only protein itself but also other nutrients for a sizable group of women. Further reasons are the physiologic importance of protein in pregnancy and the need to obtain it from dietary sources only. Thus, it becomes apparent that various factors would be taken into consideration in deciding what information to try to obtain and how best to obtain it. Any instrument devised to procure this desired information should then be tested for reliability as well as validity. Interviewers should be trained in its use. It would seem desirable for interviewers to record at the time of the interview amounts of specific foods or food groups consumed rather than value judgments of "low," "medium," and "high." If such categorization is to be done at all, it could be done more objectively as a separate step.

This study calls to mind the frequency with which public health and clinic personnel are asked to do dietary interviews without the benefit of adequate training. One contribution public health nutritionists might well make to the collection of more valid data is to work with such personnel in developing methods suitable for the purpose and situation at hand.

Summary

The diets of sixty-seven pregnant women on the island of Kauai, Hawaii, were investigated through interview by trained nutritionists in June and July, 1956, in order to: (a) obtain a picture of the nutritional adequacy of the diets of a sub-sample of the women in the Kauai Pregnancy Study, and (b) test the validity of a quick, "gross" method of dietary estimation being used by interviewers in the Study.

Findings of the Special Dietary Survey revealed that low intakes of individual nutrients occurred in 6 to 34 per cent of the women. Median intakes for the group compared somewhat more favorably with the admittedly generous recommended allowances.

The findings by the "gross" method agreed with those of the more refined Special Dietary Survey in only about one-fifth to one-half of the cases for the various food and nutrient groups. Findings in regard to milk consumption, on the other hand, agreed within a 2-cup range in five cases out of six. Thus the simple, "gross" method, which was essentially like those frequently used in clinical work, was adequate only for obtaining relatively simple information and not for assessing the over-all nutritional value of the complex Kauai diets.

It is suggested, therefore, that when a simple, quick method of estimating dietary intake is indicated, one be developed to suit the situation on the basis of a preliminary study done by accepted techniques.

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Fat consumption in the U.S. last year reached an all-time high—almost 120 lb. per person, according to the USDA's Economics Research Service. Of this, two-thirds came from invisible fats, with meats, poultry, game, and fish providing 42 lb. invisible fat, nearly 3½ lb. more than in 1947-49.

A Pilot Study in St. Paul

Household Records of Foods Used and Discarded[1]

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The feasibility of obtaining data on foods discarded, as well as used in household food consumption surveys, has been explored by the authors. The method used and some of the findings about the participants' use and discard of food and household characteristics that seemed to influence their practices are reported. Such information is needed to improve nutritional appraisals of food used in the home and to prepare more realistic guides on selecting the family's food supply.

PRESENT-DAY STUDIES of food used by households tell about food taken off the market and from home farm and garden but rarely provide information on the kinds and amounts of edible food which for one reason or another are not eaten. Uses of information from surveys of food consumed in households would be greatly extended if consumption figures could be evaluated in terms of probable physiologic ingestion by household members.

Gathering data on food discards adds greatly to the length and tediousness of interviewers' visits with homemakers. It also requires that homemakers record data during the rush of meal preparation and serving. Furthermore, homemakers are reluctant to give such information, probably influenced by the time-honored precept of "waste not, want not" with which older homemakers, especially, grew up and which became, "waste not that others may eat" with the Food for Freedom campaign following World War II.

This study was undertaken to learn how to improve methods for obtaining information on discard of food in households and to provide the initial contribution to a compilation of such data from various groups of households in this country. As a result of experiences in this study, a recall method for getting information on food discards along with food use was developed and tried in a random sample study in the winter of 1960; it will be reported later.

Earlier attempts to study relationships between economic consumption and intake of food in households and in institutions indicate the importance of discards of edible food in the kitchen and at the table, and especially in rural communities, in the feeding of household supplies to pets and other animals (1-7).

Food Record Method

Detailed records of use and discard of food for a seven-day period were obtained from participating households. A well-schooled interviewer assisted by the homemaker inventoried the kinds and weights of food in the kitchen at the beginning and end of the record week. During the week, the homemaker recorded weights of additional foods brought into the kitchen from home storage, store, or other source. She also recorded kinds and weights of foods containing edible parts that were discarded, fed to pets,

[1]This study was carried out under a cooperative project between the Household Economics Research Division, Agricultural Research Service, U. S. Department of Agriculture, and the Agricultural Experiment Station, University of Minnesota. Received for publication January 26, 1961.

stored for later use, or given away. Meat bones, vegetable skins, fruit pits, and other refuse were not considered edible parts of foods.

Pertinent data recorded about family characteristics included: number, ages, and sexes of persons in the household; number of meals eaten during the week from home food supplies by household members and guests; employment away from home; education of the homemaker; usual weekly expenditures for all food; and presence of pets or other animals fed from household supplies.

To reduce record-keeping, simplify the homemaker's job, and increase accuracy, only two or three groups of homogeneous foods were covered at a time in each of four phases of the study: Phase I, meat, poultry, fish, and fats and oils; Phase II, grain products, and sugars, sweets; Phase III, dairy products and eggs; and Phase IV, vegetables, fruits, nuts. Use of the same method in each phase and schedule forms that were easy to fill out systematized the collection of data. This four-phase record method was evolved from findings in a series of test interviews with families in Washington, D. C. and Dawson, Anoka, and St. Paul, Minnesota prior to collection of data from the households in this study.

A set of two scales was left in each household. One, in pounds and ounces, was used for foods weighing 1 lb. or more. The other scale, in grams, was used for foods weighing less than 1 lb.

For accumulating fat for salvage and discard during Phase I, a set of cans was left, the number in the set depending on household practices. The maximum number was six, labeled as follows:

Fat from drippings—2 cans
  a. Expect to use
  b. Do not expect to use
Separable fat from meat—2 cans
  a. Raw
  b. Cooked
Oil, shortening, table fats—2 cans
  a. Expect to use
  b. Do not expect to use

In addition to reducing record-keeping for homemakers and adding to the precision of the data, the cans tended to catch family interest.

During each phase, a homemaker spent about 5 to 7 hr. a week assisting with inventories, weighing food, recording data, being instructed, and conferring with the interviewer.

Interviewers visited a household at least twice during each phase, at the beginning and end to inventory food. In between, one or more supervisory visits were usually made during a household's participation in each phase.

Homemakers were given careful explanation of the purpose of the study. The word "waste" was avoided to minimize any guilt homemakers might feel about discarding food. In a few instances, overlong storage or failure of a product made at home resulted in considerable discard which homemakers might have hesitated to report if unsure of the interviewers' objectivity and understanding of discard practices. Homemakers recorded kinds and amounts of food fed to animals. Although not questioned, they usually volunteered their reasons for large discards.

Volunteer Households

Participating households lived in the Northwest section of St. Paul, Minnesota. The homemakers who volunteered to participate were primarily friends of the interviewers. A few were suggested by cooperating homemakers, a school principal, and a manager of a public housing development. Data were collected from February 1958 to June 1959.

No information was collected on incomes, although usual food expenditures in terms of household size provide some indication of the economic situation of the group (Table 1). These data, plus the fact that few homemakers were employed away from home, substantiated interviewers' observations that incomes perhaps ranged from "low" to "middle" with very few households, if any, having high incomes.

TABLE 1 **Characteristics of volunteer households**

ITEM	PHASE I	PHASE II	PHASE III	PHASE IV
Number of households	62	62	62	62
Food expenditures per person per week*	$ 5.64	$ 5.64	$ 5.47	$ 5.53
Household size in persons*	4.5	4.6	4.6	4.5
Children in household:				
Under 7 yr.	63	62	59	58
7 to 9 yr.	43	41	44	45
10 to 19 yr.	69	74	74	74
Homemakers				
Age in years	38	38	38	38
Years of school attendance	13	13	13	12
Employment away from home				
Full time	6	6	6	7
Part time	2	5	7	7
Households with pets	29	32	26	31

*21-meal-equivalent persons. Total meals eaten from household food supplies divided by 21 gives number of persons in household.

The number of households that supplied data for each phase of the study was maintained at sixty-two by replacing each household that dropped out with another of fairly similar size and composition. Of the original sixty-two households in Phase I, nearly 90 per cent continued cooperation for Phase II, and approximately 80 per cent continued for Phases III and IV. Of the original sixty-two households, forty-nine cooperated in all four phases. Drop-outs were primarily due to family situations, such as illness, death, vacation, or a move to a new home. Drop-outs were not approached for cooperation in later phases of the study.

As shown in Table 1, the sixty-two households participating in each phase were on the average similar in expenditures for food; in household size and composition; in age, education, and employment away from home of homemaker; and in number of households having pets.

Food Discards and Caloric Losses

The most important observation thus far made from the data concern the loss of calories, total and from the nutrient fat, in the food discards; the data are given in Table 2. Relationships between food discards and selected household characteristics indicated in Tables 3 and 4 give some clues useful in planning future dietary studies.

BY GROUPS OF FOOD

On the average, about 18 per cent of the total calories and 22 per cent of the calories from the nutrient fat in the meat, poultry, and fish brought into these households was lost in discards of edible parts of these foods (Table 2).

Total caloric losses from other groups of food averaged much lower: from table fats, shortening, and other fats and oils, about 9 per cent; from vegetables, fruits, and nuts, and grain products, about 5 per cent each; and from dairy products, eggs, and sugars and sweets, 2 or 3 per cent each. Percentage-wise, losses in calories from the nutrient fat were similar to losses in total calories for these groups of food.

Of the 560 calories per person per week lost through discards of meat, poultry, and fish, more than 90 per cent were from the nutrient fat, much fat having been drained or trimmed from meat in the kitchen and at the table. The high fat content of discards reduced the total calories in the meat, poultry, and fish from 1090 calories per pound "as purchased" to 970 calories per pound presumed eaten, and the calories from the nutrient fat from 72 per cent to 68 per cent.

IMPORTANT TYPES OF DISCARD

All households discarded some meat, poultry, and fish, the average being 1 lb. out of the 13 lb. used

TABLE 2 Average quantities of food, total calories, and calories from fat—available, discarded, and presumed eaten—per person per week in 62 volunteer households

ITEM	PER PERSON PER WEEK						
	Meat, poultry, fish	Fat, oils*	Grain products	Sugars, sweets	Dairy products†	Eggs	Vegetables, fruits, nuts
Food							
"As purchased" (lb.)	2.90	0.67	1.99‡	1.09#	10.25¶	0.69	6.93
Discarded‖							
Weight (lb.)	0.22	0.05	0.11‡	0.02#	0.31¶	0.02	0.42
Proportion (%)	7.6	7.5	5.5 ‡	1.8 #	3.0¶	2.9	6.3
Presumed eaten (lb.)	2.68	0.62	1.88‡	1.07#	9.94¶	0.67	6.51
Food energy**							
"As purchased" (calories)	3170	2150	4570	1860	3270	450	2400
Discarded‖							
Calories	560	190	220	40	100	10	130
Per cent	17.7	8.8	4.7	1.9	2.9	3.1	5.5
Presumed eaten (calories)	2600	1960	4350	1830	3170	430	2270
Nutrient fat							
"As purchased" (calories)	2290	2110	650	110	1570	290	480
Discarded‖							
Calories	520	190	20	0	50	10	20
Per cent	22.5	8.9	3.1	0	2.9	3.5	4.2
Presumed eaten (calories)	1780	1920	630	110	1520	280	460

*Includes butter.
†Excludes butter.
‡Weight in terms of estimated flour equivalent.
#Weight in terms of estimated sugar equivalent.
¶Weight in terms of fluid whole milk (estimated calcium equivalent).
‖Food not eaten by household members, including food fed to animals.
**Calories rounded to nearest 10; therefore, "as purchased" less discarded food values do not always equal calories presumed eaten. Percentages based on unrounded figures. Source of caloric values, reference(8).

TABLE 3 Percentage of households discarding, average quantity discarded, and percentage of total discards represented by foods within food groups

FOOD GROUP OR ITEM	HOUSEHOLDS DISCARDING DURING ONE WEEK	FOOD DISCARDED	
		Quantity per household	Proportion of food group
	%	lb.	%
Meat, poultry, fish			
Fat from drippings	95	0.38	38
Fat trimmings	81	.27	27
Other	71	.34	35
Fats and oils			
Hydrogenated shortening	23	.12	49
Cooking oil	8	.04	18
Fat salvage	11	.04	17
Table fat	40	.02	11
Salad dressing	18	.01	4
Lard	5	*	1
Grain products			
Flour, flour mix	63	.29	41
Cereals, meal	65	.07	11
Bread			
Total	77	.24	36
Enriched	45	.18	26
Other baked goods	27	.04	6
Pastes, other	26	.04	6
Sugars and sweets			
Sugars	40	.04	31
Sirup, molasses	18	.03	27
Candy	10	.03	23
Other sweets	19	.02	19
Dairy products			
Fluid milk	85	1.19†	93
Other	48	.08†	7
Eggs			
Whole eggs	53	.09	97
Egg yolks or whites, separated	6	*	3
Vegetables			
Potatoes	81	.51	40
Dark green and deep yellow	47	.06	5
Dry beans and peas	19	.06	5
Other	98	.65	50
Fruits			
Citrus	24	.11	19
Other	58	.47	81
Nuts			
Peanuts, peanut butter	10	*	25
Other nuts	6	.02	75

*Less than 0.5 per cent.
†Pounds as consumed, not in equivalents.

per household per week (Table 3). Drippings from meat and poultry and oil from canned fish represented 38 per cent of discard, while fat trimmed from meat and poultry accounted for 27 per cent. The remaining 35 per cent was mostly trimmings or bits of raw and cooked pork, beef, and chicken, luncheon meats, and canned fish. Only a small part was cooked lean meat trimmed of fat.

Discards of meat as fat from drippings were frequently high, about 35 per cent of the households discarding at least ½ lb. as drippings during their record week. About 20 per cent discarded at least ½ lb. fat as trimmings from meat.

Other types of large discard usually were reported by a very few households during the survey week, as would be expected in a group of only sixty-two households. Among these were: spoiled meat; old and rancid fat or oil used for deep-frying or browning; moldy sirup; stale candy; leftover potatoes; spoiled home canned fruit; rancid nuts and peanut butter; soured milk; lumpy dry skim milk; decayed raw fruit; insect infested or stale flour and flour mixes; ends of bread loaves; burned toast; spilled milk and cream; burned or otherwise ruined homemade products; excess sirup from canned fruit; and dough used by children in art work.

Small frequent discards included butter or margarine; salad dressing; bread; cereals; white sugar; milk left in cereal bowls and baby bottles; lettuce, carrots, and other vegetables left on plates and platters and vegetables spoiled in home storage.

Meat, poultry, and fish, eggs, milk, bread, and vegetables were frequently fed to pets and other animals.

BY HOUSEHOLD CHARACTERISTICS

Effort was made to discover whether proneness to discard was associated with these characteristics: expenditure for food, size of household, presence of young children in the home, and education and age of the homemaker (Table 4).

Food Expenditure. Households classified in the low group for per capita food expenditures lost somewhat fewer calories through discards of grain products (3.6 vs. 5.7 per cent) but more calories through discards of meat, poultry, and fish (20.7 vs. 14.8 per cent) than those in the high group (Table 4). The low spenders' greater caloric loss from the meat group may reflect use of meats with more separable fat. "As purchased" meat, poultry, and fish of the low spenders contained 1110 calories per pound, of which 810 were from the nutrient fat whereas similar estimates for the high spenders were 1070 and 770 calories, respectively.

Household Size. Small households lost more calories from every food group than large ones. Differences were most marked for meat, poultry, and fish (21.1 vs. 15.5 per cent), fats and oils (10.9 vs. 7.6 per cent), and grain products (6.9 vs. 3.9 per cent). The greater discards of small households may have been associated with more liberal supplies of food. Per person per week they used approximately 1.60 lb. more of vegetables, fruits, and nuts; 1.00 lb. more of meat, poultry, and fish; and 0.10 lb. more each of fats and oils, grain products, and sugars and sweets than large households. Use of dairy products by small and large households was similar.

Young Children. Presence of children under seven years of age had no marked effect on loss of calories from the food supplies. Due to the tendency of

young children to spill milk, their households might have been expected to show a much greater loss of calories from dairy products than other households. However, rate of loss in households both with and without children under seven was relatively low (3.3 and 2.3 per cent, respectively). Even when comparison was made between households with and without still younger children (under four years of age), rate of caloric loss from dairy products was low (3.6 and 2.3 per cent, respectively).

Homemaker's Age and Education. For each of seven groups of food, rates of caloric loss by households with homemakers under thirty-eight years of age and those thirty-eight years or more were similar. However, households with college-educated homemakers compared with those whose homemakers had not attended college lost appreciably more calories from meat, poultry, and fish (20.4 vs. 15.6 per cent) and from fats and oils (11.6 vs. 7.0 per cent) but somewhat fewer calories from vegetables, fruits and nuts (4.4 vs. 6.2 per cent).

Discussion

POSSIBLE FAULTS IN METHOD

Homemakers were cooperative and interested. However, it is well known that subjects in a study may change their practices to lighten duties or to gain status in the investigator's eyes. In a discard study, homemakers may serve unusually small portions or urge household members to eat everything on their plates. Also, they may overlook or forget some important discards, especially when there are guests for meals.

In a repetitive four-phase study such as this, homemakers may change their food practices increasingly in successive phases in order to lessen record-keeping. Even growing acquaintanceship between interviewer and respondent could exert an influence.

Efforts were made to minimize such tendencies. Need for maintaining usual food practices was carefully explained to homemakers and anonymity was assured. Besides, interviewers and in turn homemakers were alerted to sources of discard typical for various foods. At all visits, interviewers checked and considered with homemakers the reasonableness and completeness of recorded data in relation to food practices observed and kinds of food used. Homemakers were helped to recall and estimate discards inadvertently omitted from their records.

TOTAL EFFECT OF FOOD DISCARDS

Total calories lost in relation to those originally available in all seven groups of food (175 out of 2550 calories per person per day) amounted to an average loss of 7 per cent for all sixty-two households and their replacements. For the forty-nine households that participated in all four phases, the average caloric loss was about the same as for the sixty-two households.

Discards of meat, poultry, and fish accounted for 45 per cent of the loss in total calories and nearly 65 per cent of the loss in calories from the nutrient fat. Discards of table fats, shortening, and other fats and oils represented about 15 per cent of the loss in total calories and 25 per cent of the loss in fat calories. Discards of other foods were small components of total caloric loss: grain products about 15 per cent; vegetables, fruits, and nuts about 10 per cent; dairy products well under 10 per cent;

TABLE 4 **Calories from each food group lost through discard, by characteristics of households**

CHARACTERISTIC OF HOUSEHOLD	CALORIES LOST						
	Meat, poultry, fish	Fat, oils*	Grain products	Sugars, sweets	Dairy products†	Eggs	Vegetables, fruits, nuts
	%	%	%	%	%	%	%
Average food expenditures per person per week							
$5 or less	20.7	8.9	3.6	0.9	2.6	3.7	7.1
More than $5	14.8	8.8	5.7	2.6	3.3	2.5	4.3
Size of household‡							
4 or fewer persons	21.1	10.9	6.9	2.7	3.7	3.6	6.2
More than 4 persons	15.5	7.6	3.9	1.6	2.5	2.9	5.0
Children under 7 years							
Households with	17.7	8.0	4.2	1.9	3.3	4.0	5.7
Households without	17.7	10.2	5.6	1.9	2.3	2.1	5.1
Homemaker's age							
Under 38 years	18.5	8.9	4.2	1.8	3.4	2.8	5.6
38 years or older	16.9	8.7	5.3	1.9	2.4	3.7	5.4
Homemaker's education							
12 years or less	15.6	7.0	4.4	2.5	2.9	3.4	6.2
13 years or more	20.4	11.6	5.3	0.9	2.9	3.1	4.4

*Includes butter.
†Excludes butter.
‡In 21-meal-equivalent persons.

and the rest, 1 or 2 per cent. These food groups were even smaller components of the loss of calories from the nutrient fat.

Calories in the total food supplies were 42 per cent from the nutrient fat. The rate dropped to 40 per cent when food discard was deducted.

The over-all estimates given in the two paragraphs above must be used with discretion since the data were collected in four phases widely separated in time and in different seasons over a sixteen-month period. Also, the panel consisted of households whose homemakers had volunteered to participate rather than a random sample, and these households changed somewhat with each phase. Therefore, the data are not truly additive and may fail to represent the food use and discard of a constant group of sixty-two households.

The estimated consumption of 2550 calories per person per day for these St. Paul households is about 15 per cent below the 2980 calories reported by the random sample of households in Minneapolis-St. Paul in the spring of 1948 (9). The relatively low caloric consumption may reflect somewhat the large household size, the large number of young children, and the low expenditures for food of the households included in this study in addition to the various methodologic factors already mentioned which could influence the data.

EARLIER FINDINGS

As early as 1895 when food supplies were less abundant and varied and when cool storage was limited to ice boxes, ice houses, pantries, and root cellars, Atwater reported with astonishment his finding that food waste frequently amounted to a tenth of calories and that it was largely from animal food (7).

In 1951, in Washington, D. C., a small volunteer group of young families of two to four persons, each including a college-educated homemaker, recorded practices in food discards only a little higher than the sixty-two St. Paul households (10). The supervising home economist in an initial study in her own home for seven weeks found that discards from total food supplies resulted in caloric losses of 8 to 15 per cent a week. Over the entire period, the caloric loss averaged 11 per cent, more than half of it due to discard of fat from meat drippings. In households of nine acquaintances, the home economist found that caloric losses through discard of food supplies averaged 9 per cent, of which nearly two-thirds was fat from meat drippings.

In another pilot study in 1956-57, also by the food record method, among twenty-eight volunteer households in Dawson, Minnesota, a rural community, discards carried off 28 per cent of the potential calories in meat, poultry, and fish and 1 per cent of those in fats and oils (9). The high caloric loss from discards of meat, poultry, and fish probably reflects the interviewers' observations that there appeared to be more separable fat on meat used in households in Dawson than in St. Paul. Not only were individual meat cuts less closely trimmed at retail in the rural community but many families bought lightly-trimmed halves and quarters of animals for freezer storage.

NUTRIENT LOSS

Thus far, calculations have provided data only on losses in total calories and in calories from fat caused by the food discards. Important nutrients often low in family diets would also be lost in food discards but to a much lesser extent. The nutrients most affected would probably be ascorbic acid, vitamin A value, thiamine, and niacin since vegetables, fruits, and nuts, and grain products were the two groups of food which ranked next after meats and fats in amounts discarded.

Summary

Study of the use and discard of food among sixty-two St. Paul households that volunteered participation was made by the seven-day food record method. Only two or three groups of homogeneous foods were studied at a time in each of four phases of the study: I—meat, poultry, fish, and fats and oils; II—grain products, and sugars, sweets; III—dairy products and eggs; and IV—vegetables, fruits, nuts.

Discarding of food in the kitchen and at the table and feeding household supplies to animals resulted in caloric losses from these seven groups of food, as follows: meat, poultry, fish, 17.7 per cent of calories; fats, oils, 8.8 per cent; grain products, 4.7 per cent; sugars and sweets, 1.9 per cent; dairy products, 2.9 per cent; eggs, 3.1 per cent; and vegetables, fruits, and nuts, 5.5 per cent. Discards of all food combined resulted in a loss of 7 per cent of total calories and a drop in the rate of calories furnished by the nutrient fat from 42 to 40 per cent.

Expenditures for food, size of household, and education of the homemaker were more related to the food discards of these volunteer households at the time of study than presence in the household of young children under seven years of age or to the age of homemaker.

Findings are applicable only to the food practices of the cooperating households primarily because of the voluntary method used to gain participation. Another limiting factor may have been the four-phase procedure used for collecting data; its influence is unknown.

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BIOGRAPHICAL NOTES FROM THE HISTORY OF NUTRITION

Adair Crawford—1748–July 1795

All the intricate details of the metabolic processes involved in the production of heat and energy within the body are not yet completely understood. Hans Adolf Krebs, Nobel Prize winner in 1953, described the Krebs' cycle showing step-by-step minute chemical changes that are part of the energy-producing process; but less than two hundred years ago, scientists were struggling to get even the crudest picture of heat production in the body. Adair Crawford in Glasgow was one of these. His were among the earliest attempts to measure the amount of heat given off by the body of a living animal. He used a water calorimeter to measure the heat produced by a guinea pig and estimated the amount of carbon dioxide produced (1777-1780).

Lavoisier was conducting similar experiments, measuring the amount of ice melted in a given time and the carbon dioxide produced. Both Crawford and Lavoisier demonstrated that the animal body gave off measurable amounts of heat and that activity or muscular work increased the heat production and caused increased respiration. Crawford was on the right track but he failed to make the correct explanation because he was hampered by his adherence to the phlogiston theory. Lavoisier, who followed up Priestley's work on oxygen, was able to give the correct clue to the process as being one of oxidation, and some twenty years later (1798), Count Rumford showed that external muscular work could be converted into heat.

Adair Crawford was born in 1748. His training was in chemistry and medicine. He studied at St. George's Hospital, London, and became physician to St. Thomas's Hospital and Professor of Chemistry at the Military Academy at Woolich. When he was twenty-eight years old, he went to Scotland; possibly he was a student under Joseph Black who was then at the University of Edinburgh. Or perhaps it was later that Black became his friend. Crawford himself says that he began his experiments in the summer of 1777 in Glasgow and presented his findings to the Royal Medical Society of Edinburgh; in 1779, he published the first edition of his book, *Experiments and Observations on Animal Heat and the Inflammation of Combustible Bodies; Being an Attempt to Resolve these Phenomena into a General Law of Nature.* In 1788, he published a second edition with much additional material. Diagrams of his apparatus were given as well as quantitative data. His apparatus was graduated with extreme care, and his experiments were well planned and carefully carried out. Above all, he desired accuracy in everything he did. Joseph Priestley thought well of his work, but because there were many critics and objections to his conclusions regarding heat, Crawford discontinued these investigations and gave his time to medical work.

He had a large circle of friends and was always keenly interested in the science of his day. He was a fellow of the Royal Society and a member of the Philosophical Societies of Dublin and Philadelphia. When he was forty-six years of age, poor health forced him to retire to the country. He went to Lymington, Hampshire, and died there the following year in July 1795.

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Malnutrition in Angola[1]

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IN ANGOLA, West Africa, there are four million Bantu people, the majority of whom are malnourished. This is especially so during the hunger months, October to December. The hunger is of two types, an actual shortage of calories and a poorly balanced diet, lacking in many nutrients essential for growth and maintenance.

This paper will present: a short account of the food habits of the Ovimbundu, who live on the central plateau and constitute about one-fourth of the Bantu population of Angola; a report of surveys done on 426 school children and 225 infants; the results of feeding experiments with 79 selected students; and an account of 50 of the many typical patients with malnutrition seen in Chissamba Hospital who were rehabilitated by dietary means.

Food Habits of the Ovimbundu

Cornmeal constitutes 80 to 90 per cent of the diet of the Ovimbundu. The corn used for the mush is pounded on rocks or in a mortar and pestle and the germ and bran layers winnowed out, leaving an almost pure carbohydrate meal for food. Dried beans provide the main source of protein and are eaten several times a week. Small quantities of meat and dried salted ocean fish are used on special occasions. Milk and eggs are eaten by only a few. Fruits and vegetables are scarce in primitive villages. Green leaves, such as squash or manioc, are eaten frequently but lose much of their ascorbic acid content through overcooking. A few unusual foods, such as white ants, caterpillars, and rats, add a good but almost insignificant amount of protein to the diet. Wild fruits and vegetables in season furnish a little variety. Palm oil constitutes a good source of vitamin A but is used in small quantities. Salt is evaporated from sea water and is widely distributed throughout Angola. The salt and the dried ocean fish with their iodine content have reduced the incidence of goiter.

From this, it will be seen that the diet is monotonous, low in total calories and in almost every essential nutrient except carbohydrate. Animal protein is especially lacking. There is little variety in the cereals and vegetables used. In preparing the cornmeal, most of the protein, vitamin, and mineral content is lost. The proteins of corn are deficient in two of the essential amino acids, lysine and tryptophan, and the amino acid content of beans does not entirely supplement these deficiencies. Methionine, other lipotropic factors, and the animal protein factor, vitamin B_{12}, are too low in amount for good nutrition and growth. The majority have diets low in fats, the fat-soluble vitamins A and D, riboflavin, niacin, thiamine, ascorbic acid, and minerals, especially calcium.

The evidences of deficiencies in the food intake occur in people of all age groups, but especially in children. Enlarged, firm livers are common, even in young children. Edema of nutritional origin is widespread. Symptoms attributable to shortage of thiamine, riboflavin, niacin, and ascorbic acid, such as tingling and formication, pains in bones and joints, various skin lesions, cheilosis, angular stomatitis, and spongy, hemorrhaging gum margins occur frequently. Onyalai, which has been variously attributed to allergy, toxins, or a dietary deficiency, but whose real etiology is unknown, is also found. Malnutrition plays a part in eye conditions, such as blepharitis, follicular conjunctivitis, and corneal vascularization. Night blindness is seen. Bow legs, knock knees, and deformed chests are common, but advanced rickets is not found as frequently as one would expect, due, no doubt, to the strong sunlight to which all are exposed all year round. Pellagra, as described by Gillman and Gillman (1), and kwashiorkor, as described by Trowel, Davies, and Dean (2) and by Brock and Autret (3), are common. A high incidence of dental caries occurs. Since there is a current interest among nutritionists in the relationship between fat intake and atherosclerosis, it is interesting that in thirty-three years of medical work in Angola, only one case of coronary

[1]Received for publication April 5, 1960.

[2]The author wishes to acknowledge with appreciation the advice and help given by W. E. Strangway, M.D., D.T.M., Director, Chissamba Hospital, Angola, and the assistance given in the laboratory analyses by the African technicians.

[3]Present address: Toronto, Ontario, Canada.

TABLE 1 Stigmata of malnutrition observed in 426 students

STIGMATA OBSERVED	NUMBER OF CHANGES	
	Group A	Group B
Skin (various lesions)	33	44
Tongue (various lesions)	107	310
Hair (color, texture, and amount)	19	17
Lips (cheilosis and stomatitis)	4	21
Liver (enlarged with firm edges)	not examined	52
Total stigmata	163	444

heart disease has been diagnosed in Africans coming to Chissamba Hospital.

While about two-thirds of the Ovimbundu still have a diet lacking in total calories and in many essential nutrients, another type of malnutrition, obesity, is beginning to develop among urbanized Africans. Many of those with increased money at their disposal are adding to their already high-carbohydrate diet, more carbohydrate in the form of sugar, white bread, and polished rice instead of the needed milk, eggs, fruits, and vegetables.

Surveys of School Children

Four hundred twenty-six school children, 323 boys and 103 girls, were examined for stigmata of malnutrition. Eighty-eight students were in Group A, ages seven to eleven years, and 338 in Group B, ages twelve to seventeen. Changes were observed in the skin, tongue, hair, lips, and liver. Skin changes consisted of rough, dry, desquamating areas with depigmentation, hyperpigmentation, and sooty lesions. The color of the skin had in some instances, changed from black to dull red or grey. The tongue lesions consisted of atrophy with loss of papillae, fissures, ulcerations, serrated tongue edges, redness, and frequently red fungiform papillae. In some, the hair had changed from black to a reddish color and had become sparse with a fine texture and loss of the typical peppercorn curls of the healthy African child. Cheilosis and angular stomatitis were found, and some livers were enlarged with firm edges.

The changes noted are summarized in Table 1.

Changes typical of malnutrition observed in the 426 students totaled 607. No sex difference was noted. Seventy-nine or 89.7 per cent of the younger students in Group A had one or more changes each and 95 or 28 per cent of the older ones in Group B exhibited one or more changes. It is significant that the younger children had more symptoms of malnutrition than the older ones.

Survey on Babies

Two hundred twenty-five babies, ages one to three years and still nursing, were examined for hair changes indicating malnutrition. Of these, 103 or 43.5 per cent showed typical changes of the hair.

TABLE 2 Usual food content of boarding school and village diets

FOOD	BOARDING SCHOOL DIET	VILLAGE DIET
	gm./week	*gm./week*
Cornmeal		
Bran and germ removed	—	2500
Whole corn	1498	—
Cracked corn (bran removed)	1540	700
Manioc meal (cassava)	1155	—
Beans, dried	700	250
Fish, dried or salted, or meat	175	50
Lard (pork)	—	20
Palm oil	35	—
Green leaves, cooked (squash or manioc)	—	150
Cabbage or tomatoes (cooked)	140	—
Onions (cooked)	20	—

Many young children have low plasma protein levels which frequently result in edema. No suitable substitute for mother's milk is given to babies. When it is no longer adequate, it is supplemented by adult foods, mainly cornmeal mush. This results in much malnutrition in this age group. One advanced case of a child two years of age was admitted to the hospital. His mother had stopped nursing him when he was about a year and a half old because she became pregnant. His plasma proteins were 2.6 gm. per 100 ml. The child was edematous, vomiting, and moribund. Skim milk was given by rectum and later by mouth. Other foods were added gradually as they could be tolerated. At the end of one month, the child was discharged with plasma proteins of 6.5 gm. per 100 ml. and apparently in good health.

Feeding Experiments

Seventy-nine boys of the 426 students were selected for experimental feeding. Fifteen of these were used as controls. Table 2 indicates the usual weekly amounts of foods in the boarding school and village diets, while nutrient values of these diets are given in Table 3.

Fifty-one boys, ages twelve to seventeen, were fed the usual boarding school diet. Thirty of these received weekly, in addition, Supplement A, consisting of: 1700 gm. skim cow's milk, 700 gm. hen's eggs, 500 gm. meat (beef, goat, or hippopotamus[4]), 700 gm. oranges or lemons, and 35 gm. brewer's yeast. The other twenty-one boys were given, in addition to the boarding school diet, Supplement B, which consisted of 350 gm. peanut cake meal weekly. The diets plus the two supplements were continued for two months. The nutritive value of the boarding school diet did not meet the Recommended Dietary Allowances (4). It was low in calories, ascorbic acid, calcium, vitamin A, and the B vitamins. Only a small

[4]Hippopotamus meat was dried for use as food.

TABLE 3 **Calculated values of daily diets (5) and diets plus supplements (5-7)**

NUTRIENT	BOARDING SCHOOL DIET			VILLAGE DIET	
	Usual	Usual plus Supplement A	Usual plus Supplement B	Usual	Usual plus Supplement C
Calories	2447	2843	2647	1721	2326
Protein					
Intake (gm.)	76	111	101	50	80
Per cent of calories	12.4	16	16.5	11.5	13.7
Fat					
Intake (gm.)	16	34	21	6	40
Per cent of calories	6	11	7	3	15.5
Carbohydrate					
Intake (gm.)	499	514	509	368	412
Per cent of calories	81.6	73	76.5	85.4	70.9
Calcium (mg.)	220	619	250	114	1285
Iron (mg.)	29	35	—	12.7	13.1
Thiamine (mg.)	0.96	1.93	1.33	0.33	0.72
Riboflavin (mg.)	0.41	1.75	0.58	0.203	1.66
Niacin (mg.)	6.7	12.5	19.2	3.5	4.48
Ascorbic acid (mg.)	5.4	52.6	5.4	21.4	31.2
Vitamin A (I.U.)	4250	5500	4250	2800	4150

part of the protein was from animal sources. The addition of Supplement A raised nutrient levels so that they met recommendations for growing boys of this age group except for calcium and ascorbic acid. Supplement B increased thiamine and niacin intake to recommended levels, but intake of other essential nutrients remained low.

A third group of thirteen boys, ages ten to twelve years, who ate the usual village diet were given for one month Supplement C, consisting of 6832 gm. of whole cow's milk weekly. The village diet was grossly lacking in all essential nutrients except carbohydrate and iron. Supplement C added a good amount of animal protein and raised riboflavin, calcium, and vitamin A intake sufficiently to meet allowances, but the other B vitamins and ascorbic acid remained below recommendations.

The livers and tongues of the boys were examined weekly and at the beginning and end of the experimental periods by Dr. W. E. Strangway. Laboratory examinations of plasma proteins and hemoglobins, by the copper sulphate specific gravity method of Phillips *et al.* (8), and urinary urobilinogens were also done weekly and at the beginning and end of the experimental periods. Progressive improvement took place.

RESULTS OF SUPPLEMENTATION

The results of the supplementation are tabulated in Table 4.

While the periods of supplementation were too short to expect a complete return to health, improvement was marked, especially in the 30 boys eating the usual boarding school diet with Supplement A for two months. In this group, the average weight gain over that of the controls was 870 gm. Of the 16 with enlarged firm livers at the beginning, 9 had non-palpable livers at the end; in 4, the livers were reduced in size; and in 3, they remained unchanged. Of the 30 with tongue changes, 23 became normal and 7 improved. Nineteen of the 23 with positive urine urobilinogen became negative. In five, average plasma protein increased from 5.8 gm. to 7.5 gm. per 100 ml, and the hemoglobin average from 9.9 gm. to 11.9 gm. per 100 ml.

The results were not so marked in the 21 students on the usual boarding school diet with Supplement B for two months. However, some improvement was noted. Five of the 18 with tongue changes improved, 1 of the 3 with enlarged livers improved, and urine urobilinogen became negative in 11 of the 14 with initial positive findings.

The 13 boys eating the village diet plus Supplement C for one month showed an average weight gain over the controls of 60 gm. The most marked improvement in this group was noted in the plasma protein level which rose from an average of 6 gm. per 100 ml. to 6.9.

Hospital Dietary Rehabilitation

Fifty of the many typical cases of malnutrition seen in Chissamba Hospital are described in some detail. There were 28 males and 22 females. Eighteen were between one and four years of age, 18 between five and fourteen, and 14 were between fifteen and seventy-five.

SYMPTOMS

It was impossible to distinguish clear-cut deficiency states due to specific lacks of one or two nutrients. The majority of the patients were the victims of multiple food deficiencies. However, 25 of the children under ten years of age were diagnosed as kwashiorkor. All of these had typical changes in color, texture, and amount of hair. All were listless and apathetic and had varying degrees

TABLE 4 **Results of feeding experiments**

SYMPTOM OR MEASUREMENT	CHANGES		
	Boarding school diet		Village diet plus Supplement C (13 boys)
	Plus Supplement A (30 boys)	Plus Supplement B (21 boys)	
Body weight	average gain of 870 gm. for 30 boys	no change	average gain of 60 gm. for 13 boys
Plasma protein	average rise from 5.8 gm. to 7.5 gm. per 100 ml. in 5 boys	no change	average rise from 6 to 6.9 gm. per 100 ml. in 13 boys
Urinary urobilinogen	positive finding became negative in 19 boys, lessened in 4	positive finding became negative in 11 boys, lessened in 3	no change
Tongue lesions	cured in 23 boys, improved in 7	improved in 5 boys, no change in 13	no change
Enlarged, firm livers	became non-palpable in 9 boys, improved in 4, no change in 3	improved in 1 boy, no change in 2	no change

of edema. Twenty-one of the 25 had enlarged firm livers, 13 had dermatoses of the skin, 10 had tongue changes, and 5 had severe eye conditions, including photophobia.

The majority of the thirty-six children under fourteen years of age had distended abdomens and many showed signs of rickets with bow legs, knock knees, and deformed chests.

Many of the patients had symptoms of pellagra and hypoproteinemia. Twenty-four of the fifty patients had skin changes with various types of dermatoses. Exfoliation of the epidermis was marked in two of the men. Areas of depigmentation and hyperpigmentation with sooty lesions were common. Many of the lesions typical of pellagra appeared on parts of the body exposed to the sun. Five had Casal's ring, complete in two and partial in three. Some of these lesions had developed into ulcerating areas. One adult man had about fifty gangrenous areas superimposed on the lesions on his arms, legs, hands, feet, buttocks, abdomen, and ears. Hyperkeratotic areas and various eruptions of the skin were seen. Six had horny-like skin with deep fissures on the hands, feet, ankles, and wrists.

Forty-two had edema such as previously described by us (9). It varied from seven persons with general anasarca to those with edema of the face, feet, arms, legs, or ankles in varying amounts and combinations. Seven had abdominal ascites.

Twenty-three had enlarged firm livers, the enlargement varying from 10 to 2 cm. at the xiphoid and 9 to 2 cm. at the costal margin.

Eighteen had well developed tongue changes consisting of hypertrophy and redness of the fungiform papillae, serrations on the tongue edges, small, thin, shrunken tongues, ulcerated areas, fissures varying in number and in depth, coated areas, redness, and a glassy appearance. A definite magenta color was observed in one person.

Eight complained of severe bone and joint pains, tingling, hyperesthesia, and formication.

Blepharitis, follicular conjunctivitis, corneal vascularization, and photophobia were common. One boy had well developed night blindness.

Symptoms of scurvy with spongy hemorrhaging gum margins were present in many of the patients. The hemorrhagic bullae of onyalai were seen in one adult male and one boy. Those two patients had advanced tongue lesions as well with deep fissures and loss of papillae.

LABORATORY FINDINGS

Twenty-seven of the fifty patients had plasma protein levels below 6 gm. per 100 ml. Twenty-three of these were between 5 and 5.5 gm. per 100 ml. There was a definite relationship between the severity of the edema and the plasma protein level.

Sixteen had hemoglobin values below 9 gm. per 100 ml., four below 4 gm.

Twenty-three showed urobilinogen in the urine which varied from plus 4 to a trace.

Eight had positive protein in the urine varying from plus 2 to a trace.

Platelet counts in the two persons with onyalai were 78,000 and 86,000 per cubic millimeter. Urinary excretions of ascorbic acid during a 24-hr. period were 11 mg. and 1.5 mg.

DIETETIC TREATMENT

The various symptoms and laboratory tests indicated deficiency diseases due to a shortage of many essential nutrients, and in many cases, low total calories. Dietary treatment was given to all fifty patients.

Except for one or two who received all food from the hospital, the patients were allowed to eat their own African foods and received supplements daily in all cases of 500 to 1000 ml. fresh skim milk; 1 or 2 eggs; 100 gm. meat or dried fish; citrus fruit; other fruits, such as bananas and papayas; fresh

vegetables, such as cabbage, tomatoes, or onions; wheat bread; and vitamin tablets as indicated by the various symptoms. Niacin was given in daily dosages as high as 700 mg., 600 mg. by mouth and 100 mg. by injection. Riboflavin and thiamine were given in doses of from 50 to 100 mg. daily when indicated. Patients with symptoms of scurvy received ascorbic acid and lemon juice daily. Patients with onyalai were given 1 gm. ascorbic acid daily by injection and 1 to 2 gm. by mouth, as well as lemon juice. Treatment of onyalai with high amounts of ascorbic acid had previously been used by us with good results (10). Liver extract, cod-liver oil, calcium gluconate, and vitamin B_{12} were used when indicated. Many of the patients on admission were unable to take the complete diets since anorexia was common, but all were given skim milk from the start, and other foods were added gradually as they could be tolerated.

RESULTS OF DIETETIC TREATMENT

Patients remained in the hospital for periods varying from one month to a year. The majority were discharged in from six weeks to three months. Thirty-two were cured, fifteen improved, and three died.

Plasma protein levels rose rapidly to normal, and edema disappeared in from one to four weeks. Hemoglobin levels responded more slowly. Livers were reduced in size in from one to three months. The livers of five of the twenty-three with enlargement became non-palpable, twelve became smaller and softer in consistency, and six remained unchanged. Six of the eighteen with tongue changes were cured in from two to three months and twelve were improved. Eye conditions, cheilosis, and angular stomatitis responded well within one to two months. The majority of the skin lesions responded rapidly in from two weeks to two months, but the horny fissured lesions healed more slowly. The two patients with onyalai recovered from onyalai in one week, but the healing of the tongue required several months. The spongy gum margins improved in two to four weeks. Sixteen of the twenty-three with positive urobilinogen in the urine became negative, and the eight with proteinuria became negative. In six or eight weeks, the unhealthy red hair was cut off, leaving the normal hair of the healthy African child, black, coarse, curly, and abundant growing in its place. It was interesting the definite line of demarcation between the healthy and the unhealthy hair corresponded to the time of beginning the improved diet.

Summary and Conclusions

This paper has attempted to give a picture of malnutrition as it exists among the Ovimbundu of central Angola. The diet is grossly lacking in almost every essential nutrient except carbohydrate.

Examinations of 426 school children—323 boys and 103 girls in two groups, ages seven to eleven and twelve to seventeen—and of 225 infants showed marked clinical signs of malnutrition.

When thirty boys eating a deficient boarding school diet received supplements of varied foods, such as milk, eggs, meat, fruits, and brewer's yeast, marked improvement was seen in two months. A supplement of peanut cake meal, given to twenty-one other students for two months, produced some improvement, but not nearly as much as in the first group. Supplementation of the regular village diet with whole milk for one month caused some improvement in thirteen students.

Fifty typical cases of malnutrition among patients admitted to Chissamba Hospital are reported. Changes in skin, hair, and tongue, enlarged livers, and edema, all of which indicate the prevalence of such deficiency states as pellagra, kwashiorkor, and hypoproteinemia, were seen in these patients. Subsistence on regular African diets with supplements selected for specific nutrient contributions resulted in marked improvement in these patients in periods varying from one month to one year, with an average of six weeks to three months.

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Frozen Precooked Sauces[1]

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ON THAWING, a curdled appearance and liquid separation are frequently noticed in frozen sauces and gravies thickened with wheat flour or corn starch in certain types of home- and commercially-prepared frozen precooked foods. Reports of the search for satisfactory thickening agents stable to freezing have been reviewed by Hanson, Campbell, and Lineweaver (1) and by Tressler and Evers (2). In their own extensive investigations, Hanson and co-workers (1, 3, 4) found that sauces thickened with starch or flour from waxy cereals, particularly waxy rice flour, were most stable to freezing.

Flours from waxy cereals, while available for commercial products, may not be readily obtained for home use. Hence, this study was designed to compare wheat flour with flours from certain waxy cereals for use in frozen precooked sauces and creamed dishes prepared and stored under simulated home conditions. The findings, it was anticipated, might likewise be applicable to products made in the institutional kitchen for which relatively short periods of frozen storage might be convenient.

Materials and Methods

WHITE SAUCES

The cereal thickening agents included in this study were: (a) an all-purpose commercial wheat flour widely used for home cooking, (b) a commercial waxy rice flour, (c) a commercially prepared waxy cornstarch[3], and (d) two samples of laboratory-prepared flour from white waxy corn. No commercial waxy corn flour was available at the time.

One of the waxy corn flours was prepared by adaptation of a method used by Dvonch, Kramer, and Whistler (5). Small portions of white waxy corn grains were soaked 10 to 30 min. in distilled water at room temperature to facilitate the removal of the pericarp. With a sharp-pointed knife, the embryo was removed from the grain. The endosperm was air-dried, then ground on a small electric coffee mill set for the finest grinding. The ground material was sifted through a piece of metallic dairy cloth having 60 meshes to the inch in one direction and 40 in the other. The coarse particles remaining on the sieve were subjected to further disintegration in a household electric blender, again sieved, and the small quantity of fine particles thus obtained was combined with that of the first grinding. The "flour" was much finer than cornmeal, but not as powdery as wheat flour.

Since frozen sauces prepared from this flour were promising, arrangements were made to have a few pounds of another lot of white waxy corn milled in the experimental milling laboratory of a commercial plant. The particles of this flour were considerably finer than those of the "hand-prepared" lot.[4]

The formula for the sauces was that of a medium thick white sauce. The proportions are given in Table 1. For most batches of sauce, multiples of either two or three and one-half times this formula were used.

The pasteurized milk and creamery butter were obtained as needed from the Purdue University Creamery. The margarine and hydrogenated vegetable fat, salt, and wheat flour were purchased in a retail store.

In order to have, insofar as possible, the same rate of heating for all samples, a gas burner was adjusted to heat 1 pt. tap water in a copper-clad 2 qt. stainless steel sauce pan from 18°C. (64.4°F.) to boiling temperature in 5 min. This adjustment was used throughout the study. The fat was cautiously melted in the sauce pan. The pan was re-

[1]Journal Paper No. 1476, Purdue University Agricultural Experiment Station. Received for publication September 25, 1959.

[2]The author wishes to acknowledge the assistance of Mary E. Thompson and Mrs. W. H. Daniel in the laboratory work.

[3]The white waxy corn and waxy cornstarch used in this study were supplied by the American-Maize Products Company, Roby, Indiana.

[4]The author is grateful to E. A. Pence, Research Laboratory, Iglehart Brothers, Evansville, Indiana, through whose courtesy a few pounds of white waxy corn were milled into flour in the experimental mill of the company.

TABLE 1 Formula for white sauce

INGREDIENT	WEIGHT	APPROXIMATE MEASURE
	gm.	
Fat		
Butter or margarine	21.0	1½ Tbsp.
or		
Hydrogenated vegetable fat	17.6	
Salt (table grade)	1.5	¼ tsp.
Milk, whole, non-homogenized	244.0	1 c.
Thickening agent		
General purpose wheat flour	10.5	1½ Tbsp.
or		
Waxy rice flour	10.5	1½ Tbsp.
or		
Waxy corn flour	10.5	1½ Tbsp.
or		
Combination of wheat flour with one of waxy flours	10.5	1½ Tbsp.
or		
Waxy cornstarch	5.3	¾ Tbsp.

moved from the burner, and the thickening agent and salt were combined with the fat by stirring with a wooden spoon for forty strokes. The cold milk was added all at once. The pan was returned to the burner and the mixture stirred with even strokes throughout the cooking period. The time the mixture started boiling was noted, and the cooking continued exactly 3 min. longer. Preliminary tests had shown this length of time sufficient to eliminate a raw starch taste. Observations were made on the characteristics of the sauces during cooking. Just before the pan was removed from the burner, the temperature of the sauce was noted.

The cooked sauce was cooled to 90°C. (194°F.). Immediately, samples were taken for duplicate consistency measurements by the line-spread test (6). Two or four jelly glasses, ½-pt. size, were filled to within ¼ in. of the top. Each jar was covered first with a piece of plastic film[5], then with a metal lid. The jars were immediately cooled in a refrigerator (temperature approximately 38°F. or 3.3°C.) for about 1½ hr. before they were put into a home-type freezer for freezing and frozen storage. The temperature of the freezer was maintained at about 0°F. to –5°F. (–18°C. to –20.5°C.).

A portion of the freshly made sauce was used for *p*H determinations on a Beckman *p*H Meter Model G; another portion was judged for smoothness, flavor, and appearance.

After periods of frozen storage from two to eighteen months, samples of sauces were removed from the freezer and thawed overnight in a household refrigerator. The thawed products were examined with respect to general appearance and scored on a scale from 0 to 5 for the amount of liquid separation observed. Each sauce was heated in a small double boiler with stirring at 2, 4, 6, and 14 min. At the end of 15 min., the sauce was removed from the heat and the temperature adjusted to 90°C. (194°F.). Line-spread measurements were made in duplicate, and *p*H determinations and organoleptic tests were carried out as for the freshly prepared sauces. Occasionally a frozen sauce was emptied into a small casserole and covered for thawing and heating in an oven regulated for 350°F. (176.6°C.).

Data on the consistency measurements of the sauces were evaluated statistically by analysis of variance and the F test (7), and the averages compared by a multiple range test (8).

CREAMED CHICKEN

Sauces thickened with wheat flour, waxy rice flour, waxy corn flour, and combinations of wheat flour with each of the waxy flours were used to prepare small quantities of creamed chicken for freezing. Mature hens were cooked in water until tender. The skin was removed and the white and dark portions of the meat were separated as they were removed from the bones. The broth was chilled to facilitate the removal of fat. The fat used in the sauces consisted of equal parts of the chicken fat and butter; the liquid was made up of two parts whole milk and one part chicken broth from which the fat had been removed. For each jar of creamed chicken, 100 gm. sauce were combined with 70 gm. diced chicken meat (35 gm. each of white and dark meat). Two jars of each lot of creamed chicken and two jars of each of the five sauces were frozen and stored.

Samples of these sauces and of the creamed chicken were opened after six and nine months' frozen storage. The contents of each jar were emptied unthawed into a double boiler and heated to 90°C. (194°F.). The heated samples were scored by eight or nine tasters on a three-point scale for flavor of chicken and for flavor and texture of the sauce.

Results and Discussion

WHITE SAUCES

Data were obtained on 137 batches of sauces from which 367 jars were frozen and stored. Since the sauces made with margarine and hydrogenated vegetable fat differed little from the butter sauces except in flavor (each fat imparted its own characteristic flavor), only the data on the butter sauces are included here.

The sauces, freshly made with the various thickening agents, differed somewhat in their behavior during cooking and in their mouth-feel when tasted. The wheat flour sauces cooked with relatively little tendency to spatter; they were smooth and creamy in appearance and smooth on the tongue. On the other hand, the sauces made with the waxy cereals cooked with considerable spattering. The waxy

[5]Saranrap.

TABLE 2 Average line-spread readings of sauces made with various thickening agents before and after frozen storage

STORAGE PERIOD	LINE-SPREAD READING*			
	Wheat flour	Waxy rice flour	Waxy corn flour	Waxy cornstarch†
2-Cup Batches				
Initial	6.85	6.45	6.64	6.19
3 months	6.44	7.22	6.87	—
6 months	5.88	7.17	—	6.46
9 months	6.05	7.34	6.57	—
12 months	6.01	7.55	6.82	6.75
3½-Cup Batches				
Initial	8.02	7.21	7.43	—
3 months	7.56	—	7.83	—
6 months	7.12	7.95	8.78	—
9 months	7.22	8.26	8.44	—
12 months	7.10	8.50	7.95	—

*Units are in ⅛-in. divisions beyond center circle (6).
†Amioca.

TABLE 3 Average scores* for liquid separation, appearance, texture, and flavor of frozen sauces before and after frozen storage

STORAGE PERIOD	AVERAGE SCORES			
	Wheat flour	Waxy rice flour	Waxy corn flour	Waxy cornstarch
Liquid Separation on Thawing*				
Initial	0	0	0	0
12 months	3.5	0	0	1.0
Appearance†				
Initial	5.0	4.6	4.5‡	3.0
12 months	4.8	4.4	4.3	3.0
Texture†				
Initial	5.0	4.9	4.4	2.0
12 months	4.8	4.5	4.1	2.0
Flavor†				
Initial	5.0	4.8	4.3	4.0
12 months	4.8	4.5	4.3	4.0

*Liquid separation was noted when thawed jar was first opened; scale of 0 for "none" to 5 for "very much."
†Scores based on 5-point scale with 5 the highest value.
‡Lower scores probably due to coarseness of the "hand-prepared" corn flour.

cornstarch sauces dropped from the spoon in lumps; those made with waxy rice flour or waxy corn flour had a decided tendency, even with constant stirring, to stick to the pan. Fine flecks of rice flour were visible in the cooked sauces when they were spread in a thin layer, but these were not noticeable on the tongue. Small tapioca-like particles were visible in the sauces made from the hand-prepared waxy corn flour; however, these were not objectionable. The sauces made from the flour milled in a commercial test laboratory were smooth in appearance but had some tendency to form a "long" paste. Small droplets of fat were noticeable on the surfaces of all sauces made with the waxy cereals. The rice and corn flour sauces were characterized by rice and corn flavor, respectively. Sauces made with combinations of two thickening agents were intermediate in their characteristics.

Thawed wheat flour sauces had some pockets at the surfaces next to the glass. These sauces slipped readily from the containers as molded gels, leaving the jars clean. As soon as the sauce was emptied, the liquid began to separate rapidly. The gel, when cut, appeared curdled and sponge-like. However, when the sauce was heated with stirring, it became smooth and creamy and similar to a freshly made sauce. Even those heated in the oven without stirring were satisfactory. It should be noted that the formula and method of preparation used differed from those of Hanson and co-workers (1).

Surfaces of thawed sauces thickened with waxy cornstarch were very moist, but showed no liquid separation up until twelve months' storage. They fell from the container in lumps rather than unmolding as a gel or flowing as a semi-solid; when heated, they resembled their freshly made counterparts.

Sauces made with waxy rice or waxy corn flour showed no liquid separation when thawed. Each flowed from the container as a semi-solid with some of the sauce adhering to the container. These sauces were in no wise curdled; when heated, they resembled similar freshly made sauces. The corn flour sauces had slightly more of a tendency to gelation than rice flour products.

Sauces made with a combination of one to two parts of wheat flour with one of the waxy thickening agents showed some liquid separation and had characteristics intermediate between those sauces made from each of the components.

The *p*H values of the stored sauces did not differ appreciably from those of the freshly made products.

In Table 2 are given data on the line-spread readings for sauces made with waxy cornstarch and with wheat, waxy rice, and waxy corn flours. Since the sauces made with the waxy cornstarch were not considered as palatable, fewer of these were prepared.

Analyses of variance of the line-spread readings for each of the three flour-thickened sauces showed that there was a highly significant difference (probability at 1 per cent level) between the initial values of the smaller and larger batches. This finding is in agreement with that of other investigators (9, 10). Since the rate of heating and amount of agitation (11, 12) affect the consistency of starch pastes, the thinner consistency of the larger batches may be explained, at least in part, by the longer time required for them to start boiling. The average time for the larger batches to come to boiling was 5 min.

TABLE 4 Average scores for flavor and texture of creamed chicken and of the sauces used in their preparation after six and nine months' frozen storage

STORAGE PERIOD	AVERAGE SCORES*				
	Wheat flour	Waxy rice flour	Waxy corn flour	Wheat and rice	Wheat and corn
	Flavor of Sauces Only				
6 months	2.38	2.63	2.13	2.88	2.25
9 months	2.44	2.89	2.22	2.67	2.11
	Texture of Sauces Only				
6 months	2.75	3.00	2.75	2.88	2.88
9 months	2.89	2.56	2.44	2.89	2.67
	Flavor of Creamed Chicken				
6 months	2.44	2.89	2.22	2.67	2.11
9 months	2.62	2.50	2.50	2.62	2.75
	Texture of Sauce with Creamed Chicken				
6 months	2.56	3.00	2.67	2.78	2.56
9 months	2.87	3.00	2.87	2.87	2.87

*Scores based on a 3-point scale: 3, good; 2, fair; 1, poor.

48 seconds as compared with an average of 3 min. 47 seconds for the smaller batches. The longer heating time likewise involved more stirring.

The relative thickening property of the three flours was of interest. From an analysis of the data on the initial line-spread readings of the sauces thickened with the three flours, the F-ratio test indicated that the variation was significant at the 1 per cent level. The application of a multiple range test (8), however, showed that although the differences between wheat and rice, and wheat and corn were significant, the difference between rice and corn was not. For practical purposes, the same weight of either of the thickening agents would be suitable for the proportion of liquid used in this study.

As may be observed from Table 2, the average line-spread readings for the frozen, stored, and reheated wheat flour sauces were less, indicating a thicker consistency, than the corresponding initial values. These results agreed with statements made by Fenton and Darfler (13). The difference was statistically significant at the 1 per cent level. The opposite results were observed for the waxy rice flour sauces; they became significantly thinner after frozen storage. On the other hand, frozen storage has no significant effect on the consistency of the waxy corn flour sauces. With waxy cornstarch, there was a trend toward thinning.

The scores for flavor and texture of the sauces indicated negligible change (Table 3). Even in those stored as long as eighteen months, no rancid flavors were detected. Therefore, under the conditions of this study, the sauces thickened with wheat flour, when thawed and heated, compared favorably with those made with waxy rice or with waxy corn flour.

CREAMED CHICKEN

The sauces used in preparing the creamed chicken differed from the plain white sauces in that they contained some chicken broth and chicken fat. However, they resembled the plain sauces with respect to stability to freezing. In Table 4 are given the average scores for flavor and texture for the sauces and the flavor scores for the creamed chicken held in frozen storage for six and nine months. An analysis of the data for the sauces alone indicated that the thickening agents gave rise to significant differences with respect to flavor, but not to texture. However, for the creamed chicken, there were no statistically significant differences in flavor of the product or in the texture of the sauces. The judges' comments indicated that differences in desirability of the creamed chicken samples, if any, were very slight.

DIFFERENCES IN THE THICKENING AGENTS

The difference in the stability to freezing of sauces thickened with waxy and non-waxy cereals is attributed to differences in the chemical structure of the starch component of the flours (1). The starch in non-waxy type cereal grains, including wheat, consists of both amylose and amylopectin, whereas the starch of waxy grains is almost 100 per cent amylopectin (14). The absence of retrogradation or the slowness of its development in products made with starch or flour from waxy grains is ascribed to the branched molecular form of amylopectin (14). However, the protein and/or some other components of the flour must play some part in making a product of desirable texture, since the flour was superior to the starch alone from waxy rice as reported by Hanson and co-workers

(1), and in this study waxy corn flour sauces were considered preferable to those made with waxy cornstarch.

Summary and Conclusions

White sauces thickened with wheat flour, waxy cornstarch, waxy rice flour, and laboratory-prepared white waxy corn flour were frozen and held in frozen storage under simulated home conditions for periods up to twelve months. The products prepared with the flours from waxy grains were stable to frozen storage; they showed no liquid separation when thawed. Although the sauces thickened with wheat flour exhibited syneresis on thawing, when they were reheated for serving, particularly if stirred, they were smooth and altogether acceptable.

In the case of creamed chicken, the sauces which were prepared with the three different flours, showed no statistically significant differences in flavor or texture in the products when heated for serving after frozen storage for six or nine months.

Therefore, under the conditions of this study, white sauces and creamed chicken, prepared by customary household formulas in which wheat flour was the thickening agent, were satisfactory for serving when heated even after several months of frozen storage.

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Feature on Jewish Foods

That eating in this country is becoming more cosmopolitan or international cannot be questioned. Witness the flood of specialized cook books which are finding a ready and continuing market. And supermarkets and neighborhood groceries and bakeries are today stocking "gourmet" foods, frequently of foreign origin. Do you as a dietitian know Mexican food? Italian food? the favorites from Scandinavia? Jewish food?

Such knowledge is of great value to the dietitian concerned with helping patients work out meal patterns to meet normal or special dietary requirements. From such a fund of information can come not only ideas to help people of a particular cultural group but also suggestions for unusual menu variations for the more usual American meal pattern.

In this vein, a feature of the September 1961 issue of *What's New in Home Economics* offers valuable definitions of twenty-three Jewish foods— some of which are not only delicious but economical to prepare.

Do you know what a *bagel* is? It is "A breadlike roll made of a yeast dough. It is shaped like a doughnut, glazed by simmering in water before being oven-baked." *Kreplach?* "Small squares of noodle dough, filled with meat or cheese and cooked in soup. The dish is of eastern European origin." *Hamantaschen?* "Sweet cakes, filled with honey and poppy seed, made in triangular shape, specially in celebration of Purim (a religious festival)." *Gefilte fish?* "Stuffed fish; or the fish, crumb, and vegetable mixture formed into balls." *Tzimmes?* "A sweetened dish of meat and vegetables, specially used for the Sabbath. Carrot tzimmes is best known."

Other foods or dishes for which definitions are given are: blintzes, borscht, challah, dolma, farfel, galuptze, kartoffelkloese, kasha, kichel, knish, knaidel, kuchen, kugel, latkes, linzen, mandelbrot, matzo, and strudel.

Food Preferences of South Dakota College Students[1]

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SOME STUDY has been made of what determines an individual's food likes and dislikes. A number of contributing factors appear to be involved. Vawter and Konishi, in summarizing conclusions of other investigators (1), stated that some of these factors are of biochemical, physiologic, social, and educational origin, while others reflect mental state, sex, age, religion, economic status of family, and area and size of home community. Family food attitudes handed down from generation to generation may exert an influence on food preferences.

Vawter and Konishi cited (1) a number of food acceptability studies on soldiers. They quote an Army investigator as defining food acceptability "as a question of which foods will be eaten." In addition to Army studies, investigations of food likes and dislikes have been carried out on preschool children, young and older adolescents, and adults. Among the older adolescents and young adults, both men and women, college students have been subjects of study in recent years. References to a number of these studies have been made by Breckenridge (2).

Most of the studies on food preferences have employed a check list of varying numbers and kinds of foods; in some instances, an accompanying interview has been part of the procedure. Obviously, subjective elements enter into the results of studies carried out in this way. Also, the acceptability of a food may be highly dependent on other food items offered at the same time. A procedure which furnishes the basis for a more objective interpretation of food preferences is that of the quantitative measurement of foods consumed under an *ad libitum* regimen. This method has been described by Konishi *et al.* (3) and Vawter and Konishi (1). Its principal disadvantage is that it is often not feasible.

Because regional preferences for certain foods are encountered, it becomes of interest to extend studies made in one state or part of the country to other states and other parts of the country. No studies on food likes and dislikes of college students in South Dakota have, to the knowledge of the author, been reported. It was felt that such a study might point the way to lessen food prejudices and widen food likes. The latter has important social implications, as well as nutritional advantages.

Information on food preferences is of special interest not only to those concerned with feeding large groups, but also to food producers, processors, distributors, and dealers and to nutrition educators.

Procedure

This study was part of a larger one concerned with the acceptability of lamb. The subjects were 120 South Dakota State College students, 42 men and 78 women. The majority were freshmen enrolled in home economics and pharmacy orientation courses. Fifteen of the men and 37 of the women were from farm homes and 27 of the men and 39 of the women from town homes. The place of residence of two of the women was not ascertained. The subjects were given a list of sixty-one foods and asked to check each food under one of four columns headed as follows: willing to eat often, willing to eat once a week, unwilling to eat, have never tasted. Included were some foods frequently associated with prejudices.

Findings and Discussion

Table 1 shows the foods that 20 to 100 per cent of the subjects were willing to eat often. Corn was the only vegetable well enough liked to be accepted frequently by over 90 per cent of the subjects. Only twelve of the twenty vegetables listed were selected by 50 per cent or more as foods they would be willing to eat often, although nineteen vegetables were considered acceptable as often as once a week by 10 to 30 per cent of the subjects (Table 2). Sixteen vegetables were among the foods that 5 to 50 per

[1]Approved for publication by the Director, South Dakota Agricultural Experiment Station as Journal Series No. 452. Received for publication September 28, 1959.

TABLE 1 Foods which 20 per cent or more of students were willing to eat often

FOODS	PER CENT OF SUBJECTS
Milk, butter, strawberries, apples, peaches, pears, grapes, corn, beef, fowl	90–100
Cheese, oranges, banana, raw tomatoes, plums, cherries, carrots, watermelon, green beans, peas, pork, fresh fish, ready-to-serve cereal, eggs	80–90
Cottage cheese, grapefruit, cantaloupe, apricots, cooked cereals, raw cabbage, cooked tomatoes, canned fish, veal	70–80
Rhubarb, asparagus, raisins, beets, navy beans, squash, split peas	60–70
Prunes, onions (raw and cooked), Lima beans, liver, lamb	50–60
Green peppers, spinach, cauliflower, liver sausage, cooked cabbage	40–50
Broccoli, parsnips, turnips, heart, buttermilk	30–40
Rutabaga, tongue	20–30

TABLE 2 Foods which 10 per cent or more of students were unwilling to eat often but would eat once a week

FOODS	PER CENT OF SUBJECTS
Prunes, rhubarb	30–35
Grapefruit, cantaloupe, raisins, beets, raw onion, cooked onion, parsnips, rutabaga, turnips, squash, Lima beans, heart, liver sausage, cooked cabbage, green peppers	20–30
Cheese, watermelon, plums, cherries, asparagus, green beans, broccoli, raw cabbage, spinach, cauliflower, peas, navy beans, split peas, lamb, pork, liver, tongue, fresh fish, canned fish, home-cooked cereal, ready-to-serve cereal	10–20

cent were unwilling to eat; included were such common vegetables as asparagus, squash, onions, broccoli, cabbage, and tomatoes (Table 3). Five to 50 per cent of the subjects had never tasted ten vegetables (Table 4). Five of the best liked vegetables in descending order were: corn, raw tomatoes, green beans, peas, carrots, and raw cabbage. The two with the lowest acceptability were rutabagas and turnips. The unpopularity of many vegetables has been cited by other investigators (1, 4).

More of the subjects indicated a willingness to eat a wider variety of fruits often than was the case with vegetables; acceptability was restricted to once a week for only a few fruits. The best liked fruits in descending order were: strawberries, apples, peaches, pears, and grapes. Bananas, oranges, cherries, and plums were also well liked as indicated by the high percentage of the subjects that were willing to eat them often. Only three fruits—apricots, cantaloupe, and rhubarb—were disliked to the extent that as many as 5 to 10 per cent were unwilling to eat them.

Among the meats, beef, fowl, pork, and fresh fish were the most popular; veal was liked by a smaller percentage of the subjects and lamb and the glandular organs were the least popular. Organ meats were classed among "disliked foods" by Lamb *et al.* (4) and rated low in a study by Kennedy (5).

The ready-to-serve cereals were somewhat more popular than the home-cooked ones, with 5 to 10 per cent of the subjects indicating an unwillingness to eat cooked cereals.

Dairy products, except for buttermilk and cottage cheese, were acceptable to high percentages of the subjects. Ninety-five to 100 per cent were willing to drink milk, and 100 per cent were willing to eat butter often, although cottage cheese and buttermilk found frequent acceptance by only 73 and 39 per cent, respectively. Approximately 20 per cent were unwilling to eat cottage cheese and 35 per cent were unwilling to drink buttermilk. Eggs were accepted frequently by 85 per cent of the subjects.

Food likes and dislikes of people tend to reflect the food practices in the homes in which they grew up. Foods to which they are accustomed are usually more acceptable than those with which they are less familiar. In surveys of diets of South Dakota women, most of whom were homemakers (6, 7), foods most frequently reported as eaten by the women were often found to be the most popular in this study. This was true of vegetables, fruits, and meats. In contrast to the popularity of milk by the college student, consumption of milk as a beverage and of fruits and cereals by these women was low, even though practically all of them indicated that they used milk in food preparation. Apparently, it was available in the home, and it is likely that the students were accustomed to drinking it before coming to college.

Some differences were found in the food likes and dislikes of men and women. A higher percentage of women than men were willing to eat fruits often, but the situation was reversed for vegetables and meats. Low acceptability of vegetables by both men (1) and women (4) has been reported by others. On the other hand, Kennedy found (5) that women rated vegetables as well as fruits higher than men, and Eppright has reported (8) that a larger proportion of women than men rated vegetables "very good."

In this study, home-cooked cereals were reported acceptable often by a higher proportion of men than women, but acceptance of ready-to-serve cereals was about the same for both sexes. The acceptance of whole milk was slightly higher by men than by the women, but over twice as many men as women were willing to drink buttermilk often.

A comparison of food acceptance by town and farm residents showed that a higher proportion of students from urban homes than from rural homes

TABLE 3 Foods which 5 per cent or more of students were unwilling to eat

FOODS	PER CENT OF SUBJECTS
Parsnips, turnips	40–50
Green peppers, buttermilk, spinach	30–40
Cooked cabbage, Lima beans, rutabaga, asparagus, brains, liver	20–30
Tongue, liver sausage, split peas, navy beans, squash, raw onions, broccoli, prunes, cottage cheese, heart, cooked tomatoes	10–20
Raw tomatoes, cantaloupe, apricots, rhubarb, raw cabbage, cooked onions, lamb, canned fish, eggs, home-cooked cereals	5–10

were willing to eat often most of the foods listed. Abbott *et al.*, who studied food preferences of young and older Florida men from both rural and urban areas, found (9) vegetable acceptability higher for the urban men of both age groups. Eppright likewise found (8) that urban people had a greater liking for vegetables than people living in "open country" and "rural places," but, based on the response of "very good" to the entire list of foods, "open country" people showed greater acceptance of foods than people of rural or urban areas.

Reasons given by the subjects for not liking certain foods were related to taste, odor, appearance, physiologic and psychologic reactions, unfamiliarity, and family attitudes and practices.

The importance of seeking to overcome food dislikes depends in part on the extent to which they interfere with adequate nutrition. Young and LaFortune concluded (10), from a study on food preference and nutrient intake, using eighty-one Cornell University freshmen women, that, on a group basis, food dislikes did not seem to influence the adequacy of the diet. They found that the verbalized food dislikes were primarily items which do not appear in menus frequently enough that their omission seriously affects the nutritive content of the diet. In their study, the greatest effect on nutrient intake seemed to be failure to ingest in sufficient quantities certain food items, such as milk, cereal products, eggs, and so on, which were rarely mentioned as strongly disliked by any of the subjects.

In general, no attempt has been made in food preference studies, including the present one, to relate preferences to dietary adequacy. This is an important field requiring future investigation.

Summary

Food acceptance by 120 men and women at South Dakota State College, chiefly freshmen in home economics and pharmacy, was studied using a check list of sixty-one different foods.

TABLE 4 Foods which 5 per cent or more of students had never tasted

FOODS	PER CENT OF SUBJECTS
Brains	60
Broccoli, tongue, cauliflower	30–40
Heart, lamb, rutabaga, cooked onions	20–30
Buttermilk, split peas, liver sausage, beets, veal	10–20
Asparagus, turnips, navy beans, green peppers	5–10

Whole milk and butter were highly acceptable by both sexes and by both urban and farm residents. Most fruits and certain meats ranked next in acceptability, as indicated by the expressed willingness of the students to eat these foods often. Vegetables as a class and lamb and organ meats were least acceptable.

A higher proportion of women than men were willing to eat fruits often, but a higher proportion of men than women indicated willingness to eat most vegetables and meats frequently.

Acceptability was higher for most foods for students coming from town homes than farm homes.

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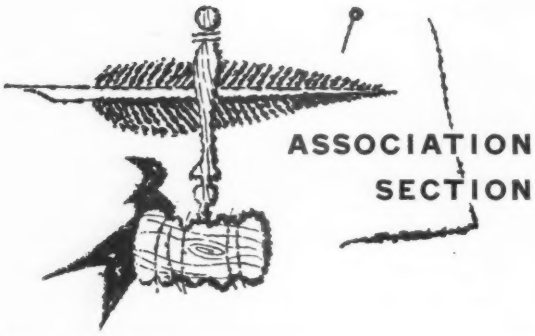


Mary W. Northrop Named 1961 Copher Awardee

THE HIGHEST AWARD of The American Dietetic Association is the Marjorie Hulsizer Copher Award, which goes each year to a distinguished member for outstanding work for and in the profession. This year, Mary W. Northrop, former Director of Dietetics, King County Hospital, Seattle, was named the repicient of this Award at the Annual Banquet of the Association on October 26 in St. Louis.

The Award carries with it an honorarium involving the income from a fund totaling $15,000 established by Dr. Glover H. Copher as a memorial to his wife, a leader in dietetics until her death in 1935. The fund is administered by the Trustees of Barnes Hospital, St. Louis, where Mrs. Copher was Director of Dietetics until her marriage. Presentation of the award to Miss Northrop was made by Dr. Frank R. Bradley, Director of Barnes Hosptial, who said:

The Copher Award represents the highest honor of The American Dietetic Association and its recognition of distinguished service to the profession of dietetics. It was the intent and hope of Dr. Copher, who made possible the Award, that through the selection of outstanding recipients, there will be the incentive for members of the dietetic profession, particularly in hospital service, to become administrative dietitians and heads of departments.

The modern acute general hospital is perhaps the most complex form of organization in modern society. Hospitals have grown rapidly since 1920 and they now represent the third largest service function in the nation. The reasons for the hospital's rapid growth are (a) the fact that it is an institution most essential to medical practice because it makes available to doctors and their patients skills and equipment, organized into services, that the individual doctor or even groups of doctors cannot finance and administer; and (b) the shift of population from country to town and city, together with the fact that many members of the family are employed and cannot provide home care, as was done fifty years ago. The patient wishes to be in a hospital where he can receive care. The result is that over 95 per cent of us today are born in hospitals and more than one in eight of us will be in a hospital this year.

The complexity comes because of new developments and more effective methods of diagnosis and treatment. This brings with it increased specialization. Thus the hospital is increasingly the product of a complex form of cooperation between medicine, nursing, dietitians, administrators, technicians, and many other paramedical personnel. A most important cooperating group and service is the department of dietetics which in its own right requires the highest type of departmental organization and leadership. Dietetics, like all professions, must provide from within its own membership the spark and driving force that sets standards and provides leadership, so that professional service is forthcoming. If the dietetic profession does not provide this leadership but depends on others outside its ranks, it is no longer a profession but merely a group of skilled technicians. It is most important to the continuing existence and success of the profession that the framework and the spirit of the profession be such that it attracts recruits in sufficient numbers to carry out the function the profession professes to perform. While it is desirable or possible that the leaders and teachers be highly trained academically, the number is too few. The essential thing is that these teachers be competent administrators, professionally motivated, emotionally mature, and able to teach at the graduate level.

We agree with the recipient of this year's award that "to develop a mature and experienced administrative dietitian, a year's internship is obviously impossible. We receive from the college a young woman of little experience and little social sophistication . . . One cannot, therefore, expect to develop a mature and experienced dietitian during the brief period of an internship."[1] The intelligent solution to this problem is to develop additional years of graduate training, beginning with a residency in the second year.

We buttress our argument for persuading interns in dietetics to become leaders and administrators by quoting an address by Mary W. Northrop at the 33rd Annual Meeting of this Association in Washington, D. C., on October 18, 1950:[2]

> One of the first objectives of the internship should be to see that each young dietitian has the right "porpoise" [purpose], a good energetic one which will keep "treading on her tail." This involves helping her to resolve in her own mind the apparent conflict between much contemporary thinking—in many cases the thinking of her own family—and the professional approach . . . With the *right* "porpoise" [purpose] comes the motivation that makes the game worth the candle.

To illustrate her argument, Miss Northrop quotes from the song the Mock Turtle sang to Alice in Wonderland which started this way:

> "Will you walk a little faster?" said a whiting to a snail.
> "There's a porpoise close behind us, and he's treading on my tail."

Alice was apparently very much a denizen of this decade, for at the close of the song, she said,

> "If I'd been the whiting, I'd have said to the porpoise, 'Keep back, please; we don't want *you* with us.' "
> "They were obliged to have him with them," the Mock Turtle said. "No wise fish would go anywhere without a porpoise."
> "Wouldn't it really?" said Alice in a tone of great surprise.
> "Of course not," said the Mock Turtle: "why if a fish came to *me*, and told me he was going on a journey, I should say, 'with what porpoise?' "
> "Don't you mean purpose?" said Alice.
> "I mean what I say," the Mock Turtle replied.

[1] JOURNAL 32:548, 1956.
[2] JOURNAL 27:403, 1951.

Mary W. Northrop, outstanding dietitian and beloved leader in your profession, you rank high among those who foster, develop, and advance the profession of dietetics. Your career and your philosophy are sources of inspiration for those who may wonder if the long road in dietetics and administrative work is worth following. It is with great and sincere pleasure that we welcome you to the ranks of those distinguished members of your profession who have received the Marjorie Hulsizer Copher Award.

In accepting the Award, Miss Northrop replied:

When I first learned that this signal honor was to be conferred upon me, I pondered for some days, as I think most people would under similar circumstances. It seems to me that I have done nothing outstanding; yet I cannot question the judgment of those who made the decision.

There it is! Because I have not been unusual, I represent a whole generation of dietitians who carried the weight of a new profession in the days when the very idea that women might have an obligation outside of their homes was new. This did not often include married women, with their necessarily divided loyalties. But marriage came later then, and there was a clear slice of time when there could be whole-hearted devotion to a career. What earnestness, verve, and ambition we brought to it! We reaped great rewards, too. Our salaries were small and our working hours were long, but we were rich in the sense of accomplishment. We were rich, too, in being the direct successors of the pioneers who were just before us, and most of whom were well known to most of us. So, as a representative of those who may now be moving toward retirement and of those who started with us but have meanwhile dropped out of the race, it is a great honor to accept the Marjorie Hulsizer Copher Award.

My hope is that we have been successful in passing on to those of you who are the future what we so abundantly received—pride in our profession and joy in pushing it forward. Our old methods are outdated in the new world of unsaturated fatty acids, prepared convenience foods, electronic ovens, computing machines, and automation. But ideals and fundamental principles never change. The changed social pattern has given you a harder task than ours, however. We were able to build a career out of whole cloth or retire to the side-lines. You must cut two garments from that piece of cloth, without skimping either one. The cloth has not increased in size. I do not envy you the problem.

I have confidence in the dietitians who are younger than I. Who has a better right to confidence, since I have known so many of you? I have pride in our Association and our profession, for we have done the best we could, and our performance was not bad. The indications are that your generation can, if you so will, be better.

The citation engraved on the Marjorie Hulsizer Copher Award plaque which Miss Northrop received reads: "IN RECOGNITION OF HER BELIEF IN AND HER UNDAUNTED SUPPORT OF THE ADVANCEMENT OF THE PROFESSION OF DIETETICS; HER EXCELLENCE IN UTILIZATION OF EQUIPMENT AND LAYOUT; HER TALENT FOR ADMINISTRATION OF HOSPITAL FOOD SERVICE; HER WISDOM IN COUNSELING AND GUIDANCE OF THE DIETETIC INTERN; HER RESOLUTE LEADERSHIP TO THE ASSOCIATION AS SECRETARY, CHAIRMAN OF COMMITTEES, AND JOURNAL BOARD MEMBER AND HER CONTRIBUTIONS TO PROFESSIONAL LITERATURE."

Dr. Williams Is Made Honorary Member of A.D.A.

THE AMERICAN DIETETIC ASSOCIATION honored Dr. Robert R. Williams at its Annual Banquet in St. Louis on October 26 by conferring on him honorary membership. In making the announcement, Doris Johnson, Ph.D., President of the Association, said:

Honorary membership in The American Dietetic Association is given to those individuals who have made notable contributions to the field of nutrition and dietetics. In presenting such honorary membership, we, too, are honored.

The recipient of honorary membership in The American Dietetic Association this year is a man of great distinction in the science of nutrition and biochemistry. We think of this outstanding scientist especally for his role in the synthesis of thiamine and the great contribution this made to the health of millions of people throughout the entire world. Few scientists have devoted themselves as much to the practical application of their scientific discoveries for the benefit of mankind as has Dr. Robert R. Williams.

He has shown outstanding leadership and dedication to research, encouraging and leading others into the pathways of fundamental investigation into the mysteries of the life about us. He served as Chemical Director of the Bell Telephone Laboratories for many years. His writings have been numerous; the most recent, *Toward the Conquest of Beriberi*, is a thrilling account of one of the great achievements of our times.

Dr. Williams' great feeling for the wonders of nature and man's part in it are beautifully expressed in a paper published in our JOURNAL in May 1941 entitled "The Evolution of Man's Dietary Requirements." I would like to quote the last part of this paper to you:

"Since man's kinship to the lower forms of life is so intimate, I find it difficult to avoid the conclusions that human thought, human society, and indeed the spirit of man is of one piece with the entire evolutionary process which began in the mud aeons ago. If so, our future adventures are to be extensions of what has gone before. This thought I have tried to put into verse under the title:

CHEMISTRY TO THE SPIRIT

I hold within my hand a twig of growing tree
And mark with mystery the sculpture on the leaf.
That shape peculiar speaks thy personality
Distinct 'mongst all the plants that share thy chemistry.
Within the germ from which thou sprang there must have stood
The figure of some field marshal of the molecules
Whose mind conceived that pattern ere thy first bud burst.
I contemplate the green stuff of those shining leaves
That seize from out the atmosphere spent gas
Of burning bush and dying man, the breath
Of putrefaction and decay to make
The substance of the stalk that rears thy head to heav'n
And lifts up water ton on ton to feed the dews of night.

We hold within our hands the crude stuff of our human souls

Where mind and matter mix. Half-conscious and half-cosmic are
The forces we observe. Across the ether of the spirit
You send a message to some soul that quickens pulse or flames desire
Unto some action eminently physical and yet
We cannot trace it through its course from lips to brain nor brain to hand.
At kidney, throat and base of brain lie tiny glands
Which rule the conduct of the man, yet are themselves
Impelled by mental imagery, emotions' fire, to send
Through blood stream potent stuffs to do a wizardry.
Can you but stimulate the hormones of high hope
Suppress those of despair and hate, kindle a sense of beauty,
Picture the glories of a growing race, the destiny of man,
You have a part in the creation; you too are very God."

Dr. Williams' citation reads: HONORARY MEMBERSHIP IN THE AMERICAN DIETETIC ASSOCIATION IS PRESENTED TO ROBERT R. WILLIAMS IN RECOGNITION OF HIS OUTSTANDING CONTRIBUTIONS TO HUMAN NUTRITION AND BIOCHEMISTRY; SYNTHESIS OF THIAMINE AND DEDICATION TO THE APPLICATION OF THIS GREAT RESEARCH ACHIEVEMENT TO THE ALLEVIATION OF SICKNESS, SUFFERING, AND DEATH AMONG THE RICE-EATING PEOPLES OF THE WORLD; VISION IN ESTABLISHING THE WILLIAMS-WATERMAN FUND AND WISDOM IN EXPANDING NUTRITION RESEARCH AND PROGRAMS THROUGH ITS FACILITIES—IN APPRECIATION OF HIS PROFESSIONAL RECORD CHARACTERIZED BY SINCERITY, IMAGINATION, GOOD JUDGMENT, AND BREADTH OF KNOWLEDGE IN THE SCIENCE OF NUTRITION; CONSTRUCTIVE, INSPIRATIONAL, AND DEDICATED LEADERSHIP; SERVICES IN THE CAUSE OF BETTER NUTRITION TO THE WORLD AND TO THE NATION, INCLUDING HIS LEADERSHIP IN THE DEVELOPMENT OF A CEREAL ENRICHMENT PROGRAM.

Gertrude G. Blaker Becomes 1961 Mary Swartz Rose Fellow

AT THE annual banquet of The American Dietetic Association on October 27 in St. Louis, Horace L. Sipple, Executive Secretary of The Nutrition Foundation, announced that Gertrude G. Blaker had been awarded the Mary Swartz Rose Fellowship of the Association for 1961-62. In making the presentation, Dr. Sipple said:

In December of this year, The Nutrition Foundation will be twenty years old. It is difficult for any of us to grasp just how much progress has been made in the broad field of nutrition since 1941—progress in research and professional development in which we can all take a certain amount of pride. We can forget, for the moment, the things we didn't accomplish and remember only the things we did.

We, in The Nutrition Foundation, have been pleased with the purposeful results that have come about from the establishment of the Mary Swartz Rose Fellowship in 1948. As many of your members will recall, the first award was made to The American Dietetic Association itself "in recognition of the leadership, inspiration and diligence of its members in applying and in developing the science of nutrition in hospitals, government service, food clinics, public health agencies, school lunchrooms, colleges and universities, and in industrial organizations for the advancement of human health. And in further tribute to its members who, during the past thirty years, have steadily raised the professional standards of dietitians to their present high level of training and service."

Since 1948, the awards have been made to individuals, whose subsequent records have indicated the wisdom shown by the Association's Awards Board in making the selections.

The Nutrition Foundation and The American Dietetic Association have the same basic interests that we have had since the founding of our respective organizations. Those interests are raising the professional standards of dietitians ever higher. The Mary Swartz Rose Fellowship is a means toward that end, and the Nutrition Foundation is delighted to be associated with The American Dietetic Association in the continuation of this program.

In previous years, you have heard at these presentations what a warm-hearted, generous woman Mrs. Rose was, a woman with the highest ideals of her profession, and one who would never let an opportunity pass to aid a young person gain advanced training. Those who knew her will testify that while she was a very inspirational person, she was also a very practical one, a realist. She knew that the path to the doctoral degree is a long and thorny one, with personal obligations to be met as well as a dissertation to be written. She was well aware that recognition of sound professional work was a greater inspiration than a check representing only money.

The winner of this year's award was selected from an outstanding group of candidates, any one of whom would have been a meritorious selection. I hope that the other applicants find comparable support for their advanced studies. The Awards, Scholarship, and Loan Fund Board of The American Dietetic Association has chosen Gertrude G. Blaker of Michigan State University as the recipient of the 1961 award.

We agree with the Board's conclusion that Miss Blaker has superb qualifications. She comes from Barneston, Nebraska, where she was Salutatorian of her high school class and the winner of a State Regent's scholarship. She was graduated from the University of Nebraska in 1940. From 1941 to 1944 she was with the University Hospitals, Western Reserve University, Cleveland. In 1945, she took a post with a commercial food service in Phoenix, and from 1947 to 1948 was with the Food Service of Grinnell College. In 1948, she went to Cornell University, where she taught, did graduate work, and was granted her master's degree in 1951. Since then she has been engaged in teaching and research at Michigan State University. She has written for the JOURNAL OF THE AMERICAN DIETETIC ASSOCIATION and is now an Associate Professor in the School of Hotel, Restaurant, Institution Management at Michigan State University.

Mead Johnson Awards for 1961

Recipients of the Mead Johnson Awards in Dietetics for 1961-62 were announced at the Annual Banquet of The American Dietetic Association on October 26

in St. Louis, by Doris Johnson, Ph.D., President of the Association.

A Mead Johnson Award for Advanced Graduate Education in Dietetics for this year was awarded to: *Jacqueline Dupont*, who is working toward a doctoral degree at Florida State University. Miss Dupont holds a bachelor's degree from Florida State and a Master of Science degree from Iowa State University.

Arlene Payne was named as the second recipient this year of a Mead Johnson Award for Graduate Education. Miss Payne is doing graduate work at the University of Chicago leading to a doctorate. She is a graduate of Kansas State University, holds a master's degree from Teachers College, Columbia University, and took a dietetic internship at the University of Michigan Hospital, Ann Arbor. Each of these awards amounts to $1000.

In addition, recipients of the Mead Johnson Awards to Dietetic Interns for 1961-62—which amount to $500 each—were announced as follows:

Noreen H. Crowley, a graduate of Framingham State College, who is interning this year at The Ohio State University

June Dee Frantzen, who holds a bachelor's degree from Indiana University and is currently a dietetic intern at the VA Hospital, Hines, Illinois

Gladys Tamie Fujimori of the University of Hawaii, who is taking her year's internship at the University of Michigan Medical Center

Emma Jean Longenecker, a graduate of Pennsylvania State University. She is presently an intern at Cincinnati General Hospital

Marilyn McElhoe, University of California, who is completing her professional education as a dietetic intern at the University of California Medical Center, San Francisco

Grace M. Moody, who holds a bachelor's degree from Colorado State University and is now a dietetic intern at the VA Hospital, Houston

Norma Sharon Thomas, an alumna of the University of Missouri, who is interning at the University of Kansas Medical Center

Janet B. Tribe, a Simmons College graduate, now a dietetic intern at the University of California Medical Center, San Francisco

Joni Kay Walker of Oklahoma State University, who is interning at Baylor University Medical Center

Elizabeth Braden Yarborough of Oregon State College, who is taking her internship at the VA Center, Los Angeles

Mary B. McCann Wins Lydia J. Roberts Essay Award

WINNER OF the 1961 Lydia J. Roberts Essay competition was announced at the Annual Banquet of The American Dietetic Association in St. Louis on October 26. Mary B. McCann received the honorarium of $500 made possible by the Gerber Products Company for her essay on "World Problems in Infant Care." Miss McCann, who is Instructor in Nutrition, Harvard University School of Public Health, is a graduate of Marymount College, Salina, Kansas, and holds a Master of Science degree from Harvard University School of Public Health.

Due to the exceptional merit of a second essay submitted in the competition, the committee gave honorable mention to Harriet A. Stevens, Assistant Professor, Home Economics Department, State University of Iowa, Iowa City.

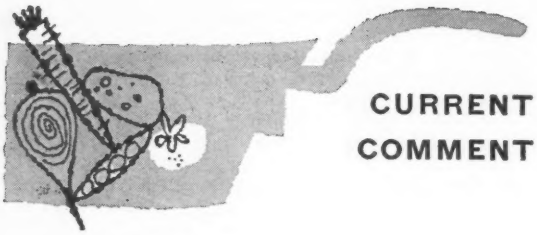
At the same time, Doris Johnson, Ph.D., President of the Association, announced that the Gerber Baby Foods Fund has extended the grant, making it possible to continue this competition for five years more.

The subject for the 1962 competition will be: "A History of Food Composition Tables." Subjects for the four succeeding years, as well as the revised rules for the competition which will apply for the next five years, will be announced in the January issue of the JOURNAL.

Iron Nutrition in Young Women

Even though we in America are better nourished than ever before, an unnecessarily large number of nutritional problems do exist, according to Dr. Philip L. White, Secretary, Council on Foods and Nutrition, American Medical Association. In speaking at a luncheon sponsored by the Campbell Soup Company on October 11 in Boston, Dr. White pointed especially to the problem of iron nutrition in adolescent girls.

"Every ounce of weight gained is viewed with alarm by many adolescent girls. They are likely to avoid meat, eggs, and enriched flours and cereals—all good sources of iron. Combine the possibility of inadequate iron stores, avoidance of good dietary sources of iron, and the iron lost during menstruation, and you are likely to find trouble. When the girl marries during her 'teens' and begins to produce a family, the iron requirement for fetal growth adds an extra strain. If the young woman approaches even her first delivery with a moderate to severe iron deficiency anemia, more often than not her child will soon develop a troublesome anemia. Iron absorption from food is really quite small—0.5 to 3 mg. per day. It is almost impossible for depleted stores to be replenished through diet alone. Therapeutic doses of iron are usually required. Then special attention must be paid to the inclusion of rich sources of iron in the diet of the mother and of the child following therapy."



CURRENT COMMENT

Shakespeare's Use of Food in the Historical Plays

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THE CHARACTERS in Shakespeare's plays, being creatures of flesh and blood and not mere creations of the mind, have a healthy interest in food and drink, an interest, however, which is not exploited, but which is developed naturally from personal characteristics and situation. This interest in food is especially noticeable in the historical plays.

It is, perhaps, a point worthy of note, as an example of Shakespeare's keen observation of the psychology of his characters, that the great protagonists in the historical plays, hero and villain, when speaking of food, usually refer to it in the generic sense—a feast, a banquet, a bowl of wine, food, sweets; while characters of lower rank more often refer to specific items of food — a cup of Madeira and a cold capon's leg, eggs and butter, a gammon of bacon, stewed prunes, a good dish of prawns.

Aside from Sir John Falstaff, that greatest of all figures of comedy, whom it was impossible to portray fully except through the pleasures of eating and drinking, the mention of food and drink in the historical plays is merely incidental; yet the psychologic reaction to food described is the natural expression of the mental processes of the characters. In this is a significance which lies quite below the surface and which will bear interpretation.

The great lords and kings who are the heroes of the historical plays, with their minds on England's greatness, and the villains of these plays, with their minds on "treasons, strategems and spoils," think of food usually in the generic sense, as something to sustain life. On the other hand, the lesser characters who pass in and out of the unfolding plots and pageants, unsustained either by great heroism or villainy, find a more material pleasure in the mouth-watering mention of specific eatables—toasted cheese, cakes and ale. An interesting instance showing the contrast of these distinctions is in the speech made by Henry VI, when, meditating on the vanity of royal state, he speaks with envy of the shepherd's homely curds, a specific allusion, and in the next breath he speaks in the generic sense, of

> a prince's delicates,
> His viands sparkling in a golden cup.
> *(Henry VI, Part III, Act II, Scene v, Lines 51-52).*

Meals in Elizabethan England

Entering on the consideration of food, *per se*, we find that the Elizabethans, like ourselves, followed to some extent the custom of three meals a day. Breakfast, however, in the modern sense of an early morning meal, was often dispensed with as the typical Elizabethan contented himself with dinner and supper only. Breakfast, in any case, was rather a light meal (1). In *Henry IV, Part I*, the franklin from the wild of Kent with the gentlemen of his company, who are preparing before daybreak to go from Rochester to London, calls for eggs and butter for their breakfast *(Act II, Scene i, Lines 58—66)*.

The most important meal, and in many instances the first meal of the day, was dinner, to which casual invitations were given to chance-met friends, whereas for supper, special preparations were made (2). The hostess says of Falstaff, "He is indited to dinner to the Lubber's-head in Lumbert Street" *(Henry IV, Part II, Act II, Scene i, Line 30.)*. Poins says, "I have bespoke supper to-morrow night in Eastcheap" *(Henry IV, Part I, Act I, Scene ii, Lines 143, 144)*. And in the historical plays, there are many other references to dinner and supper. When Lieutenant Bardolph says to Corporal Nym and Ancient Pistol, "I will bestow a breakfast to make you friends" (*Henry V, Act II, Scene i, Lines 12, 13*), he was, in all likelihood, extending an invitation to dinner.

That the Elizabethans, like some moderns we know, complained of pre-breakfast doldrums, is evidenced in the following passage from *Coriolanus*, which, though its events be Roman, is, like all of Shakespeare's plays, Elizabethan in context. Menenius, speaking of Coriolanus, says.

> He was not taken well; he had not din'd.
> The veins unfill'd, our blood is cold, and then
> We pout upon the morning, are unapt
> To give or to forgive; but when we've stuff'd
> These pipes and these conveyances of our blood
> With wine and feeding, we have suppler, souls
> Than in our priest-like fasts: . . .
> *(Coriolanus, Act V, Scene i, Lines 50-56)*

As to the hours of serving meals, we are told that the nobility, gentry, and students ordinarily ate dinner at eleven before noon, and supper at five, or between five and six in the afternoon. The merchants seldom ate before noon and six at night, especially in London. Too, there was a "long sitting" at the table. The nobility, gentlemen, and merchants, especially at great meetings, would sometimes sit until 2 or 3 o'clock, at which time they would go to

evening prayer and return just in time for supper (1).

When no guests were present at mealtime, only a few dishes were served; when there were visitors, more were served, the number increasing in direct ratio to the stateliness of the occasion. At such times, great provision was made to have all kinds of "delicate meats." In such cases, jellies of all kinds, mixed with a variety of flowers, herbs, and fruits, as well as "marchpane" tarts, conserves of old fruits, "suckets," marmalades, sugar-bread, gingerbread, Florentines, and other confections seasoned with sugar were also served (3).

Meats of all kinds were the foods most favored, beef, mutton, and veal being the staples. White meats, milk, butter, and cheese were considered inferior, but the wealthy ate the flesh of all kinds of domestic cattle, all sorts of fish taken from the sea and the fresh rivers, and wild and tame fowls, both native and those brought from other countries. The roast beef of England, famous long before Shakespeare's day, receives due commendation in the memorable lines in which the French enemy characterizes the English on the eve of the battle of Agincourt:

Constable of France: . . . give them great meals of beef and iron and steel, they will eat like wolves and fight like devils.
Orleans: Ay, but these English are shrewdly out of beef.
Constable: Then shall we find to-morrow they have only stomachs to eat and none to fight.
Henry V, Act III, Scene vii, Lines 160-166

Elizabethan Sweets

After supper came the "banquet," or dessert. In the Middle Ages, there was usually a distinction, which is no longer made, between a banquet and a feast, a feast being a rich meal of several courses and many dishes, while the banquet was a single course, often following the feast, consisting of sweetmeats, fruits and wine, which, in town houses, was served in a room adjoining the dining hall. In summer, the country gentleman, or anyone fortunate enough to possess a walled garden, would retire with his guests to the garden bower or arbor in the orchard. Shallow, after entertaining his friends at supper, says, "Nay, you shall see my orchard, where, in an arbour, we will eat a last year's pippin of my own graffing, with a dish of caraways, and so forth" (*Henry IV, Part II, Act V, Scene iii, Lines 1-4*).

"Caraways" were sweetened cakes flavored with caraway seed, the caraway plant being a species of parsley. Along with the pippins were served "leather-coats," a kind of russet brown apple. The wine was sack, of which a prodigious quantity was consumed. "What you want in meat, we'll have in drink," says Davy, echoing his master's hospitality (*Henry IV, Part II, Act V, Scene iii, Lines 29-31*).

For a typical Elizabethan meal in the home of a country squire, we may turn to the supper served by Justice Shallow to his old friend, Falstaff.

Shallow: By cock and pie, sure, you shall not away tonight. What, Davy, I say!

*****

But for William cook: are there no young pigeons?

*****

Some pigeons, Davy, a couple of shortlegged hens, a joint of mutton, and any pretty little tiny kickshaws, tell William cook.
(Henry IV, Part II, Act V, Scene i, Lines 1-30)

"Kickshaws" were small dishes of various types, highly spiced and seasoned.

What a tavern supper was like may be inferred from the bill found in Falstaff's pocket:

Item, A Capon	2 *s.* 2 *d.*	[approx. 30c]
Item, Sauce	4 *d.*	[approx. 5c]
Item, Sack, two gallons	5*s.* 8 *d.*	[approx. 79c or 80c]
Item, Anchovies and sack after supper	2 *s.* 6 *d.*	[approx. 35c]
Item, Bread	ob.	

(Henry IV, Part I, Act II, Scene iv, Lines 586-590)

A supper dish very popular in the summer was salad, then called "sallet." Cleopatra does honor to this English dish in the lines

My salad days
When I was green in judgment
(Antony and Cleopatra, Act I, Scene v, Lines 73, 74)

A remarkable variety of herbs went into the making of "sallets." Salads were made of fleur-de-luce, turnip tips, succory (a wild lettuce), dandelion leaves, spinach, dock leaves, sorrel, samphire, borage, bugloss, rosemary, and the leaves of musk roses. Cowslips, violets, primroses, longwort, liverwort, and purslane were also grown in gardens for salad use.

Vegetables, it would seem from the scanty mention of them in the medieval books of household affairs and cookery, were not widely eaten in England until early in the sixteenth century. A number of vegetables, we are told, were in common use in Shakespeare's day, though only radishes, garlic, mustard, fennel, and leeks are mentioned in the historical plays. Blackberries, strawberries, mulberries, prunes, apples, oranges, and grapes and other fruits are mentioned in the historical plays. The "apply-john," which Falstaff detested, was a special kind of apple which shriveled when kept, but gained in flavor. Oranges were imported from Spain and sold in the streets at seven for two pence. (2).

Spices

Among the materials employed in medieval cuisine, without doubt spices and condiments occupy the first place. In the medieval kitchen spices were used far more lavishly than today. Rare and costly, they were brought from the Far East. In the historical plays, reference is made to: spices in general, salt, pepper, vinegar, nutmeg, ginger, sugar, honey, and mustard.

Salt was used for many purposes even as an insecticide to destroy fleas in the church pews. In the churchwarden accounts of St. Margaret's, Westminister, 1610, there is this entry (4):

> Paid to goodwyfe Wells, for salt to destroy the fleas in the churchwardens pew 6 d.

As a rule, possibly because of its provenance from the East, sugar was classed with spices. But honey made a very tolerable substitute. Sugar had to be imported, mainly from Syria, Rhodes, Cyprus, Candia, Alexandria, and Sicily. For families of moderate means the price was prohibitive.

Tewkesbury mustard, named for the famous battlefield, was a favorite condiment. Falstaff, sneering at Poins, says: "His wit's as thick as Tewkesbury mustard" *(Henry IV, Part II, Act II, Scene iv, Line 262)*.

Sweets are mentioned a number of times in the historical plays, but more often than not, in the generic sense. Hotspur speaks of "pepperginger-bread." Gingerbread was one of the most popular cakes in Shakespeare's day, but the name seems a bit misleading when we consider one of the medieval recipes for its making. The following recipe is taken from *Two Fifteenth Century Cookery Books* (5):

> Take a quart of honey and seeth it and skim it clean. Take saffron, powdered pepper, and throw thereon. Take grated bread and make it so stiff that it will be leched. Then take cinnamon powder and strew thereon enough. Then make it square as though thou wouldst slice it. Take, when thou slicest it, and cast box leaves above, struck thereon in cloves. And if thou will have it red, colour it with saunders enough.

The historical plays perhaps far better than any others of Shakespeare's plays represent the true feelings and genuine spirit of Elizabethan life, which Shakespeare depicts. With all his chronicling of historical facts and figures, Shakespeare is depicting his own age. For this reason his constant reference to food is significant and interesting.

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The Federal Trade Commission's Role in the Fight Against Quackery

A large group of people is very weight conscious, either in the interest of style or health, or both; and advertisers have been quick to exploit the opportunity this affords. In addition to the advertisement of a wide variety of allegedly appetite-depressant drugs and food supplements, there has been much promotion of several devices for use in weight reduction without diet. Based on the results of clinical tests of such devices conducted on its behalf, the Federal Trade Commission has proceeded against them.

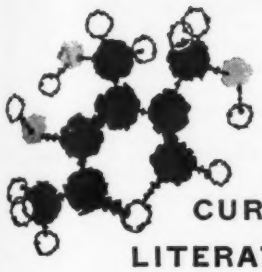
Public interest in obesity also has undoubtedly led to the advertising of some breads as being useful and effective in weight reduction, and Commission complaints involving this kind of advertising have been issued within the relatively near past.

For a number of years, Commission action with respect to the advertising of vitamin preparations was confined to isolated cases in which the claims were particularly extravagant. Within the past year, however, several complaints have been filed against the advertisers of vitamin preparations in the belief that the public interest required greater activity.

A substantial number of Commission proceedings in the nutritional quackery field have involved juice extractors and food blenders. These cases brought about the cessation of extravagant claims relating to the value of various fruit and vegetable juices for the preventing and treatment of many disease conditions, including some very serious ones.

Closely related to these nutrition cases has been a large number of Commission complaints involving the sale of cookware by house-to-house salesmen, usually by means of neighborhood demonstration dinners. During the course of such dinners, the salesman grossly exaggerated the loss of vitamins, minerals, and other nutrients occurring in the use of conventional utensils and implied that, by employing the demonstrated cookware, housewives who were the dinner guests could insure the health of the members of their families and even cure illnesses with which some of them might be afflicted.

Advertising used to promote the sale of some "medical" books to the general public probably comes closer to outright "medical quackery" than most drug advertisements. Our outstanding case involved a book entitled *Arthritis and Common Sense*. Written by a layman, it offered a ridiculous regimen for the treatment of this serious and crippling disease, and at one time, it was first on the non-fiction best-seller list.—*The Honorable Paul Rand Dixon, Chairman, Federal Trade Commission, speaking before the National Congress on Medical Quackery in Washington, D.C., on October 6, 1961.*



CURRENT LITERATURE

Contributed by: Janette C. Carlsen, The Johns Hopkins Hospital, Baltimore; Clara Karl Frederick, Lombard, Illinois; Margene A. Wagstaff, Elmhurst, Illinois; the following dietetic interns at the VA Hospital, Houston: Grace Moody, Judith A. Phillips, and Nelda Sedlacek; the following dietetic interns of Charity Hospital, New Orleans: Sonia R. Bueno and Juanita Gonzalez; and the JOURNAL *staff.*

THE AMERICAN JOURNAL OF CLINICAL NUTRITION

Vol. 9, September-October, 1961

*Obesity: physiologic considerations. J. Mayer. —p. 530.

*Some psychologic considerations concerned with the problem of overnutrition. D. G. Prugh.—p. 538.

*Some consequences of overnutrition with minerals. D. M. Hegsted.—p. 548.

*Some implications of amino acid supplementation. A. E. Harper.—p. 553.

*Effects of stress on animals fed high protein diets. E. Halac, Jr.—p. 557.

Atherosclerosis—a pediatric nutrition problem? R. E. Holman.—p. 565.

*Serum cholesterol studies in infants. A comparison of infants fed breast milk, evaporated milk and prepared milk formulas. J. Pomeranze.—p. 570.

*Folic acid, vitamin B_6, pantothenic acid, and vitamin B_{12} in human dietaries. A. S. M. Chung, W. N. Pearson, W. J. Darby, O. N. Miller, and G. A. Goldsmith.—p. 573.

Management of juvenile diabetes at Camp Nyda. A summary of methods and results based on the experiences of 1957 and 1958. M. B. Handelsman, W. C. Loughlin, and G. J. Friedman.—p. 583.

*An interracial study on the serum protein pattern of adult men in southern Africa. B. Bronte-Stewart, A. Antonis, and A. D. Moodie.—p. 596.

*Serum vitamin B_{12} levels and incidence of tapeworm anemia in a population heavily infected with Diphyllobothrium latum. W. Nyberg, R. Gräsbeck, N. Saarni, and B. von Bonsdorff.—p. 606.

*A longitudinal study of the animal protein intake of children from one to eighteen years of age. B. S. Burke, R. B. Reed, A. S. van den Berg, and H. C. Stuart.—p. 616.

*Lysine supplementation of a rice and milk diet fed to children recovering from kwashiorkor and undernutrition. T. W. Wikramanayake, C. C. de Silva, P. V. D. Fernando, and L. Jayawickremal.—p. 625.

Physiologic Considerations of Obesity. Obesity can be the result of a great many disturbances in the mechanism regulating food intake. While a general scheme is now available relating gastric contractions to hypothalamic centers and suggesting ways whereby the metabolic state of the organism influences hypothalamic function, much work remains to be done on these aspects as well as on the interrelations of higher centers. Etiology of obesity can be considered as due to genetic, traumatic, and environmental factors. Genetic factors are of interest since a large proportion of children of obese parents are obese, environment apparently being responsible only in part. Among environmental factors, Dr. Mayer believes that exercise has been very much underestimated in weight control, both in terms of etiology and therapeutics.

Psychologic Considerations of Obesity. This excellent paper deals with some psychologic considerations concerned with the problem of overnutrition in children. The author discusses the two major categories of obesity which Dr. Hilde Bruch has delineated. Children exhibiting the developmental type of obesity ordinarily are overweight from early infancy. The reactive pattern of obesity frequently involves an initial response to a family crisis in which the child may show reactive hyperphagia This may not persist, although later life events may evoke repeated similar patterns of temporary response. Treatment of obesity is considered. After much initial enthusiasm, dietary methods seem to be of much less help today than had been hoped. Bruch has indicated that diets, alone or with exercise, offer little promise in treating the developmentally obese child with serious emotional disturbance. Psychologic methods appear most appropriate. Also in children with reactive obesity, supportive psychologic measures and avoiding undue or punitive emphasis on weight loss appear to be far more wise than vigorous dietary, exercise, or drug methods of treatment. In children exhibiting relatively little personality disturbance who show prepubertal obesity or who have mildly overweight family tendencies, weight control may be aided by dietary means and exercise.

Mineral Overnutrition. Vitamin and mineral requirements are a function of the kind of diet and the level of intake of various other nutrients. It is doubtful that uniform standards will be satisfactory for all different nutritional conditions. It should be realized that the margin of safety must apply at the top as well as at the bottom in setting nutrition standards. This paper gives examples of some consequences of mineral overnutrition. A high intake of fluorine has a detrimental effect on teeth, while an appropriate amount has a beneficial effect. Dr. Hegsted is particularly concerned with the overnutrition of calcium. He states that our calcium standards are based on calcium balance studies which really give no indication of calcium need.

Amino Acid Supplementation. Certain foods which contain incomplete proteins can be improved by amino acid supplementation. For example, lysine can improve the nutritive value of individual foods to provide low-cost products which can be used as supplements for low-protein diets. But there is no need for either amino acid or protein supplementation for the person who is receiving an adequate intake of well balanced protein. The prime need for the person with a low-protein intake is to increase the over-all intake of well balanced protein.

Stress and High-Protein Diets. Growing rats were fed two levels of protein and later subjected to stresses. One stress condition was a protein-free diet. In the rats on the high-protein diet (64 per cent as casein), the mortality rate was 60 per cent against 23 per cent in the rats on normal protein diet (27 per cent as casein). These results cannot be transposed to man or other species at present. More studies are needed. In the meantime, it has not been shown that more high-protein foods are necessarily better.

Serum Cholesterol in Infants. At birth, the mean serum cholesterol level is 75 mg. per 100 ml. It rises rapidly during the first four months of life to approximately adult levels. A comparison was made of serum cholesterol levels of infants fed breast milk, evaporated milk, and a prepared milk formula in which corn oil replaced butter fat. Infants fed evaporated milk with fruit as the only supplement showed the usual rapid rise in cholesterol level, with a mean value of 187 mg. per 100 ml. at twelve weeks of age. No further increase was produced by cereals, vegetables, meat, and other dairy products. Infants fed the prepared formula high in unsaturated fats and supplemented with fruit had a significantly lower level of 127 mg. per 100 ml. After cereal, meat, and vegetables were added, the serum cholesterol level rose to 172 mg. per 100 ml. This rise did not occur after the twelfth week in infants who did not receive supplements to the prepared formula. Breast-fed infants showed a serum cholesterol pattern similar to those on the evaporated milk.

Vitamins in Human Dietaries. This study was conducted to determine the quantitative intake of folic acid, vitamin B_6, pantothenic acid, and vitamin B_{12}. Data on the intake of these vitamins from high- and low-cost and poor diets can guide the A.M.A.S. Council on Foods and Nutrition in planning suggested levels of supplementation. Data are presented. These dietary levels are equal to or greater than the estimates of adult requirements as based on the relatively meager evidence available for vitamin B_6, pantothenic acid, folic acid, and vitamin B_{12}. They provide no support for a concept of widespread dietary lack of these factors.

Serum Protein Pattern of Men. The serum protein fractions of large groups of European, Bantu, and Cape colored subjects living in South Africa are reported. Outstanding differences were a lower serum albumin level and higher gamma globulin level in the Bantu. The Cape colored subjects had

a protein pattern intermediate between that of Bantu and Europeans, particularly with respect to the globulin values. Regression analysis revealed a highly significant association between serum albumin level and dietary protein intake with serum albumin levels increasing with protein intake, but only up to a certain level. An inverse relationship existed between the serum albumin and gamma globulin levels, but factors other than dietary protein intake influenced the level of gamma globulin in the serum.

Serum Vitamin B_{12} Levels and Tapeworm Anemia. Tapeworm anemia is relatively common in Finland, and vitamin B_{12} deficiency is very common among tapeworm *(D. latum)* carriers. Of the 1345 subjects examined, 27.2 per cent had tapeworm ova. More than 50 per cent of the worm carriers had a serum vitamin B_{12} concentration below 100 mcg. per milliliter, whereas this occurred in less than 5 per cent of the controls. *D. latum* in Finland is a serious public health problem.

Animal Protein Intake of Children. The cross-sectional distributions of the animal protein intakes of sixty-four boys and sixty-one girls of the Maturity Series of this longitudinal research (conducted by the Department of Maternal and Child Health, Harvard School of Public Health) are described for the age period one to eighteen years. Wide variations in intake with age and sex are clearly shown. A comparison with Widdowson's cross-sectional values for animal protein shows that U.S. values are always appreciably higher than those for the British children. To view the data longitudinally in terms of individual patterns of consumption of animal protein, the boys and girls in the Maturity Series were classified according to their levels of intake into pattern groups by a procedure described. Values for cumulative intakes of animal protein within specified age intervals were used. The frequency of occurrence of the individual longitudinal patterns of animal protein intake are presented in the tables, and the figures show the gradation of difference in levels of animal protein intake as well as in the direction and rate of change within patterns and between pattern groups.

Lysine Supplementation of Diet. Results of a study of lysine supplementation of a rice-and-milk diet fed to children in Ceylon recovering from kwashiorkor and undernutrition are reported. The rate of growth of those given lysine was not increased and was similar to that of the group receiving the unsupplemented diet. It is evident that a mixture of amino acids rather than one amino acid is necessary to correct the deficiencies of a diet of highly polished rice.

AMERICAN JOURNAL OF PUBLIC HEALTH

Vol. 51, September, 1961

*Yearly variation in sanitary quality of well water. C. Ritter and W. J. Hausler, Jr.—p. 1347.

Sanitary Quality of Well Water. Thirteen rural wells in a Kansas county were studied for a year to determine the annual variation in the sanitary quality of the well water. Coliform and enterococcus group organisms were isolated and classified, and the "most probable number" (MPN) values of these organisms were determined. There was a downward trend in the MPN values in the fall and winter to lowest values in March and an increase in the spring to highest values in July. The authors suggest that one sample is not sufficient to evaluate the sanitary quality of a well water.

THE BRITISH JOURNAL OF NUTRITION

Vol. 15, No. 3, 1961

*The metabolism of nitrogen, calcium and phosphorus in undernourished children. 7. The effect of partial or complete replacement of rice in poor vegetarian diets by pearl millet *(Pennisetum Typhoideum)*. P. P. Kurien, M. Swaminathan, and V. Subrahmanyan.—p. 345.

*The availability of lysine in groundnut biscuits used in the treatment of kwashiorkor. K. J. Carpenter and B. E. March.—p. 403.

*The influence of illness and calcium intake on rate of skeletal maturation in children. A. Cahn and A. F. Roche.—p. 411.

Metabolism of Undernourished Children. The effect on nitrogen, calcium, and phosphorus metabolism of replacing 25 per cent, 50 per cent, or all of the rice in a poor vegetarian diet by pearl millet was studied in boys ages eleven and twelve years. The daily intake of nitrogen was nearly the same on the different diets, and all subjects were in positive balance. The apparent digestibility of the proteins and the mean daily retention of nitrogen decreased as the proportion of pearl millet in the diet increased. Although the addition of pearl millet led to a higher calcium intake, the amount of calcium retained decreased as the proportion of pearl millet increased. All were in positive balance. Both intake and retention of phosphorus increased with the proportion of pearl millet in the diet.

Lysine in Peanut Biscuits. The availability of lysine in groundnut (peanut) biscuits used in the treatment of kwashiorkor was investigated. The loss of available lysine on cooking was determined by chemical analysis and by biologic assay. In a biscuit meal containing 41 per cent groundnuts and 15 per cent skim milk powder, on cooking, only about half of its lysine units were free to react with fluorodinitrobenzene. If the dried skim milk was added after cooking, the proportion of the lysine units remaining reactive was considerably greater. Biologic assay with chicks confirmed the chemical findings. In contrast to the available lysine, the total lysine content was apparently no different in the two biscuit meals. The fluorodinitrobenzene procedure for estimating available lysine has been useful for this type of material, but more work is needed before it can be applied to vegetable materials in general.

Illness, Calcium Intake, and Skeletal Maturation. Data are presented on the incidence of illness, calcium intake, and skeletal maturation in 120 normal Australian children examined serially from two to seven years. Neither the amount of illness nor particular types of illness had any influence on the level of skeletal maturity or the rate of change in skeletal maturation. There was no indication that, within the range of calcium intake of these children, the calcium intake had any immediate or delayed effect on the rate of skeletal maturation. These findings do not exclude the possibility that skeletal maturity might be influenced by illnesses of greater severity than those observed or by lower calcium intakes than those recorded.

CANADIAN MEDICAL ASSOCIATION JOURNAL

Vol. 85, September 16, 1961

*A long-term study on the use of appetite suppressants. W. H. leRiche and G. E. van Belle.—p. 673.

Appetite Suppressants. A long-term study of appetite suppressants, using two active drugs and a placebo, in four different patterns was conducted with 237 adult patients, mostly women. The experimental period was eighteen weeks. One group, in addition to receiving the drugs, was placed on a diet of 1000 calories per day. Average weight losses for two eight-week periods were: (a) D- and DL-amphetamine as cation exchange-resin complex of sulfonated polystyrene—first period, 9.3 lb., second period, 8.1 lb.; (b) two phenyltertiarybutylamine as cation-exchange resin complex of sulfonated polystyrene—first period, 10.6 lb., second period—4.8 lb.; (c) b plus 1000-calorie diet—first period, 16.2 lb., second period, 4.9 lb. The initial and total weight losses were significantly greater when an appetite suppressant was combined with a diet. Side effects were few; "dry mouth" accounted for 62 per cent of those reported.

CIRCULATION

Vol. 24, September, 1961

*The persistence of high body sodium in previously edematous patients with heart disease. H. J. Carroll and S. J. Farber.—p. 626.

High Body Sodium. Measurements of total exchangeable sodium were made in patients with heart disease rendered free of edema following congestive heart failure. Total exchangeable sodium in most of the patients was higher than would have been predicted on the basis of body weight and total body water. Serial measurements showed that some patients gradually lose their excess sodium over a period of months without loss of body water. Others maintain an elevated ratio of body sodium to body weight and body

sodium to body water for periods of at least several months. The data imply the possibility of significant quantities of osmotically inactive sodium in patients with heart disease.

DIABETES

Vol. 10, September-October, 1961

*Lipoprotein patterns in diabetes and the changes occurring during pregnancy. A. Vernet and E. B. Smith.—p. 345.

Lipoprotein Patterns in Diabetes. An abnormal serum lipoprotein component, the (pre-β-l), is known to occur in patients with clinical coronary artery disease, but it is not clear whether it arises as a result of myocardial ischemia or precedes it and contributes to the pathogenesis of atherosclerosis. This component was studied in seventy-six diabetic patients of several years' standing on the assumption that they would have more atherosclerosis than normal persons of the same age. There was no difference between patients with uncomplicated diabetes and normal controls in the amount or frequency of occurrence of the p-β-l. This strongly suggests that this lipoprotein is not implicated in the development of cardiovascular disease in diabetes. In pregnant diabetic women, there was a considerable increase in p-β-l at term and in the first two weeks postpartum. In the patients in which the pregnancy was unsuccessful, the p-β-l became grossly elevated. The factors involved in this large production of p-β-l are unknown. This study shows that these abnormal liproproteins are not exclusively associated with atherosclerotic vascular disease.

FOOD TECHNOLOGY

Vol. 15, September, 1961

*Food, history and problems. E. M. Mrak—p. 20.

*Effect of ionizing radiation on cakes and biscuits made with milled irradiated wheat. N. L. Webb, B. E. Rutherford, and D. E. Wiant.—p. 386.

*Effectiveness of ascorbic acid in preventing the darkening of oil-blanched French-fried potatoes. W. W. Hawkins, V. G. Leonard, and J. E. Armstrong.—p. 410.

Food, History, and Problems. In this paper, the four great revolutions caused by man and the results of these revolutions are briefly discussed. These include the discovery of the use of fire, the discovery of practical agriculture, the development of cities, and the scientific revolution. The scientific revolution is still taking place. The central part of this great revolution is the discovery that nature can be controlled and conditions modified. The author discusses in detail the problems relating to the use of chemicals in agriculture and food. He is particularly concerned about uninformed people who would decrease our food production drastically by prohibiting the use of all agricultural chemicals, synthetic fertilizers, and food additives.

Cakes and Biscuits Made with Irradiated Wheat. Panel scores and physical measures of plain cake showed no differences in the baking quality of flours made from wheat treated with as much as 93,000 rad ionizing radiation. However, panel scores for biscuits made with irradiated milled wheat showed significant differences in all attributes tested: color of crust and crumb, flavor, tenderness, texture, and acceptability. The 23,000- and 70,000-rad samples showed no differences from the standard except that the 70,000-rad sample was scored less desirable in flavor. The 46,000-rad product was scored lower than the standard in flavor, tenderness, and texture, and the 93,000-rad product scored lower than the standard for all attributes except texture. Physical measurements of the biscuits indicated only that the 70,000-rad and standard doughs were slightly more compressible and softer than the other, but there were no differences in dough elasticity or biscuit volume.

Ascorbic Acid in Preventing Darkening in Potatoes. The effectiveness of ascorbic acid in preventing the darkening of potatoes was investigated. Ascorbic acid kept susceptible potatoes from darkening when they are cooked by boiling or put through the oil-blanched French-frying process. The ascorbic acid is applied during the blanching in water before partial cooking in oil. The amount of ascorbic acid needed is relatively large. The effective amount of any agent to prevent darkening will vary according to the concentration of chromogenic materials in the potato and the conditions of cooking.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Vol. 177, September 9, 1961

*Frozen custard. Questions and Answers.—p. 736.

*Cholesterol in cheese. Questions and Answers.—p. 737.

Vol. 177, September 23, 1961

*Thiamine metabolism and beriberi. Foreign Mail–India.—p. 878.

*Serum lipids in undernourished children. Foreign Mail–India.—p. 879.

*Diet for diabetic child. Questions and Answers.—p. 886.

Vol. 178, October 7, 1961

*A liquid pregame meal for athletes. K. D. Rose, P. J. Schneider, and G. F. Sullivan.—p. 30.

*Excessive fluorine in water. Foreign Mail–India.—p. 86.

*Fluoridation. Questions and answers.—p. 95.

Frozen Custard. Regular commercial ice cream contains cow's milk and its fat; cane or beet sugar; a vegetable gum, such as karoya or locust bean gum; a stabilizer, such as sea moss or kelp; gelatin; and usually a small amount of a chemical emulsifier. In addition, the desired flavor, fruits, coloring, chocolate, or nuts may be added. Custard ice cream implies that egg is used. Soft ice cream differs from the regular type in containing about 4 per cent milk fats compared with 10 to 14 per cent. Sherbet always contains milk as well as sugar, fruit juice, water, and at times small amounts of the chemicals used in ice cream.

Cholesterol in Cheese. The only cheese products which could be considered cholesterol-free are those with an extremely low fat content. Two cheeses of this type are cottage cheese and sapsago, a hard cheese made from skim milk. The latter is made in Switzerland and is flavored with ground dried clover. These fat-poor cheese products contain about 0.001 per cent (0.3 mg. per ounce) cholesterol. A number of cheese-like products are produced from whey. These are referred to as ziger or ricotta. Although they have a somewhat higher fat content, they contain less cholesterol than is found in Cheddar cheese, which contains 0.1 per cent (31.5 mg. per ounce) cholesterol. Cheeses in general contain cholesterol in proportion to their fat content. Since most cheeses contain between 30 and 40 per cent fat, cholesterol content will run from 0.05 to 0.14 per cent (15 to 40 mg. per ounce.)

Thiamine Metabolism and Beriberi. Infantile beriberi is common in Burma but rare in India in economically comparable groups. The Burmese mothers were found to excrete less thiamine in the urine and milk than the Indian women. Parenteral administration of the vitamin increased both the milk-bound and free thiamine level, but the bound form showed rapid increase in the Burmese nursing mothers. This difference in the thiamine metabolism in Indian and Burmese nursing mothers seemed to be related to the higher incidence of infantile beriberi among the Burmese children.

Serum Lipids in Undernourished Children. The changes in the serum lipid levels in malnourished and normal children between one and three years old were studied. Total and free cholesterol and cholesterol ester levels in malnourished children were low compared with normal children, but the ratio of cholesterol ester to total cholesterol was almost the same. There were lowered values for total protein, serum albumin, and beta globulin fraction, while alpha-1, alpha-2, and gamma-globulin fractions showed a small rise in the malnourished. There was a significant lowering of the serum alpha-lipoprotein level and higher beta-lipoprotein levels in the malnourished children as compared with the controls.

Diet for Diabetic Child. There are various ways in which one may work out a dietary prescription for a diabetic child. Such methods serve only as rough guides, and in any individual case, the prescription should be altered to suit individual needs and should take into account the child's activity, body build, and complicating conditions. Calories may be prescribed by age: at one year give 1000 calories daily, and add 100 calories for each year of age until the com-

pletion of growth and development, with a maximum of about 2000 for girls and 2500 for boys. Another procedure takes into account age and weight and allows, at age one, 100 calories per kilogram; at age five, 80; at age ten, 60; and, at fifteen, 40. The adolescent diabetic girl prone to obesity may need restriction to 30 calories or less per kilogram of ideal body weight. As for percentage of carbohydrates, protein, and fat in terms of calories contributed, this is commonly set at 40 to 45 per cent carbohydrate, 20 per cent protein, and 35 to 40 per cent fat.

Pregame Meal for Athletes. In an effort to obviate vomiting in athletes before important competitive events, a liquid meal was devised, and its ingestion was so timed that the stomach would be empty at the beginning of the game. The volume of the liquid meal, served cold at 10:30 A.M., was 474 cc. The liquid meal supplied 925 calories; of these, 68 per cent were from carbohydrate, 24 per cent from protein, and 8 per cent from fat. The meal passed through the stomach in less than 2 hr. It did not differ from the conventional solid meal with respect to subsequent hunger, diarrhea, or weight changes. In those who took it, dryness of the mouth was less frequest during the game, strength and endurance seemed to be improved, and vomiting and muscular cramps were eliminated.

Excessive Fluorine in Water. A new disease which causes paralysis, thickening of bones, nervous disorder, and ultimately death was reported in the Punjab. The disease, which had been termed endemic fluorosis, was caused by drinking water with a fluorine content of 14 p.p.m. The optimal level is 1 p.p.m. and concentrations of 1.5 have been found to cause mottling of dental enamel. A complete overhaul of the public water supply in endemic areas was recommended.

Fluoridation. By using the radioactive isotope of fluorine, it has been possible to show that some fluorine when added to milk does enter the teeth, but the amount is less than that taken up from fluoridated water. It is possible that the calcium content of milk might interfere with the action of fluoride. Nothing is known of the uptake of fluoride from fruit juices. There is more certainty about the effectiveness of additions to water than to other vehicles.

THE JOURNAL OF CLINICAL INVESTIGATION

Vol. 40, September, 1961

*Endogenous production of fixed acid and the net balance of acid in normal subjects. A. S. Relman, E. J. Lennon, and J. Lemann, Jr.—p. 1621.

Endogenous Acid Production and Net Acid Balance. This study was conducted to determine whether it was possible to measure the total endogenous production of fixed acid and, by comparing this independently determined quantity with the net renal excretion of acid, to measure the net external acid balance of the body. In ten balance experiments, normal subjects in an apparently steady state were fed a liquid-formula diet which had as the nitrogen source a purified soy phospho-protein essentially free of mineral cations. The net renal excretion of acid was closely matched by the sum of: (a) inorganic sulphate in the urine, (b) total "organic acids" in the urine, and (c) the acid calculated to be released by the metabolism of the combustible cationic groups covering the phosphate residues in the dietary phosphoprotein. In three experiments, net production or excretion of acid was temporarily altered and, at the end, when a steady state had been restored, the equivalence of cumulated acid excretion with cumulated production could again be demonstrated. The relationship between acid production measured in this way and renal excretion of acid appears to be that of a true physiologic equilibrium.

JOURNAL OF FOOD SCIENCE (formerly Food Research)

Volume 26, September-October, 1961

*A study of the free amino acids in bovine muscles. R. M. Ma, M. B. Matlack, and R. L. Hiner.—p. 485.

*The distribution of thiamine and ascorbic acid in the potato tuber. S. R. Mudambi and F. Hanning.—p. 492.

*Proximate composition and sodium and potassium contents of four species of commercial bottom fish. C. E. Thurston—p. 495.

*Volatile constituents of black pepper. W. G. Jennings and R. E. Wrolstad.—p. 499.

*Nutritive value of Central American beans. IV. The essential amino acid content of samples of black beans, rice beans, and cowpeas of Guatemala. R. Bressani, L. G. Elias, and D. A. Navarrete.—p. 525.

Free Amino Acids in Beef. Paper chromatography was used in studying variations in the free amino acid content of beef muscles. In general, the variation of the peak of the curve obtained from the chromatogram was greatest in the leucine-isoleucine spot. The more tender cuts contained more leucine-isoleucine than the less tender. The amounts of these free amino acids increased from the less tender to the more tender muscles. The results suggest that the method used is suitable for a survey to determine the relative tenderness of the same muscles in different beef animals.

Thiamine and Ascorbic Acid in the Potato. Two zones that together approximate the cortical layer of two varieties of stored potatoes were compared in thiamine and total ascorbic acid content with the center region. In both varieties, the cortical layer contained slightly more thiamine than the center. In Sebago but not in Russet Burbank, total ascorbic acid was higher in the cortical region.

Sodium and Potassium in Bottom Fish. The proximate composition and sodium and potassium contents of four species of bottom fish from Pacific Coast waters were investigated. Pacific Ocean perch, Pacific cod, and lingcod were quite uniform in composition regardless of species, size, season, area of capture, and method of preservation. Sablefish varied greatly in oil content, and variations in the other constituents were rather large. Average for moisture, protein, oil, ash, sodium, and potassium are given.

Constituents of Black Pepper. Black pepper oil was found to have at least twenty-three volatile components including α-pinene, β-pinene, and D-limonene, beta-caryophyllene. A-phellandrene, reported by others, was not detected. Four samples of pepper oil differed in the relative amounts of various constituents. The methods used permit rapid screening of samples and selection for greater flavor uniformity from batch to batch.

Amino Acids in Guatemalan Beans. Rice beans, cowpeas, red beans, and black beans grown in Guatemala were analyzed for chemical composition and for the essential amino acids. All were found to be fairly similar in chemical composition. The cowpea sample was higher in lysine; the rice bean and red bean samples were higher in tryptophan. The isoleucine and valine contents were lower, and the leucine higher, in the red beans than in the other samples. When compared with the amino acid pattern of the FAO Reference Protein, methionine plus cystine was the most limiting amino acid, and leucine and tryptophan respectively the second and third most limiting. All samples contained high amounts of lysine, making beans a good source of this amino acid.

THE JOURNAL OF NUTRITION

Vol. 75, September 1961

*Algae feeding in humans. R. C. Powell, E. M. Nevels, and M. E. McDowell.—p. 7.

*Effects of feeding X-irradiated pork on rats, on their thiamine nutrition as reflected in the activity of erythrocyte transketolase. M. Brin, A. S. Ostashever, M. Tai, and H. Kalinsky.—p. 29.

*Effects of feeding X-irradiated pork to rats, on their pyridoxine nutrition as reflected in the activity of plasma transaminases. M. Brin, A. S. Ostashever, M. Tai, and H. Kalinsky.—p. 35.

*Food intake and energy expenditure of elderly women with varying-sized families. J. V. G. A. Durnin, E. C. Blake, M. K. Allan, E. J. Shaw, and S. Blair.—p. 73.

Algae as Human Food. Human feeding of algae was studied by adding algae as a supplement to the diet in amounts varying from 10 to 500 gm. per man per day. Although the bitter, strong, spinach-like flavor predominated in all the supplemented foods, the most acceptable preparations were cookies, chocolate cake, gingerbread, and cold milk. Amounts up to 100 gm. daily were tolerated. When larger amounts were added, gastrointestinal symptoms were more prominent. No other evidence of toxicity was found, and the gastrointestinal symptoms disappeared shortly after the algae was discontinued. Heat treated, dried algae can be tolerated as a food sup-

plement, but further processing will be needed if used as a major food source.

Thiamine in Irradiated Pork. The effects of feeding irradiated pork unsupplemented with thiamine on erythrocyte transketolase activity in rats were studied. The feeding of X-irradiated pork resulted in markedly depressed rate of growth and erythrocyte transketolase activity. Treatment of the rats with thiamine hydrochloride resulted in a rapid resumption of the normal growth rate and an increase in erythrocyte transketolase activity. Thiamine was destroyed to the extent of 92 and 98 per cent in pork exposed to ionizing radiations at levels of 2.79 and 5.58 megarad, respectively.

Pyridoxine and Irradiated Pork. The effects of feeding irradiated pork supplemented with pyridoxine on two plasma transaminases in rats were studied. No differences in rats were noted. Although no effect was seen on the activity of the aspartic transaminase, the plasma alanine enzyme was depressed significantly. It was concluded the rats fed the irradiated pork were subject to marginal deficiency of pyridoxine.

Food and Energy of Aged Women. For one week, total food intake and energy expenditure of elderly women living with their families were measured. Their mean age was sixty years; mean weight, 60 kg. Mean energy intake and expenditure figures for energy intake and expenditure were, respectively, 1944 and 2133 calories per day. Protein accounted for about 13 per cent of the caloric intake, fat about 43 per cent, and carbohydrate, 44 per cent. Mean daily intake of calcium was 758 mg., and of iron, 11.1 mg. The size of family appeared to have little measurable effect on the physical energy required to care for the household.

THE LANCET

No. 7199, August 19, 1961

*Possible absence of essential hypertension in two complete Pacific Island populations. I. Maddocks.—p. 396.

Absence of Essential Hypertension on Two Pacific Islands. The existence of populations which do not show the substantially higher blood pressures in later life that are characteristic of Western peoples has been established by surveys of all the inhabitants of two Pacific Islands. Apparently essential hypertension does not exist among these people, or is rare. These findings are consistent with the hypothesis that essential hypertension is qualitatively different from physiologic blood pressure, but are equally consistent with the view that essential hypertension differs from physiologic blood pressure only in degree. Such complete, relatively isolated populations merit long-term prospective study to discover whether their blood pressures change as they become "Westernized." The two island populations studied are those of Gau in the Fiji Islands and Abaiang in the Gilberts.

THE NEW ENGLAND JOURNAL OF MEDICINE

Vol. 265, September 14, 1961

*Cerebral hyponatremia. F. H. Epstein, H. Levitin, G. Glaser, and P. Lavietes.—p. 513.

Cerebral Hyponatremia. A young woman having low serum sodium had disturbing cerebral symptoms. After excluding the heart, lungs, liver, kidneys, thyroid, adrenal, and anterior pituitary glands as causes of hyponatremia, the patient was placed on a diet restricting daily water intake to 800 ml., in addition to fluids in food; intake provided only 9 mEq sodium. Serum sodium decreased and urinary sodium excretion increased from 110 to 140 mEq per day. When fluid intake was restricted entirely and only solid foods were allowed, serum sodium increased to 137 mEq per liter, and urinary sodium excretion decreased to less than 6 mEq per day. Then water intake was increased to 1000 to 1500 ml. daily and serum sodium decreased to 117 mEq per liter while urinary sodium excretion increased promptly to 150 mEq. When the water was again restricted, serum sodium increased and urinary sodium excretion decreased. In other studies on this patient, water diuresis was not improved by anticonvulsants or by large doses of prednisone. The authors believe the disorder appeared to be a consequence of inappropriate secretion of antidiuretic hormone.

NUTRITION ABSTRACTS & REVIEWS

Vol. 31, July, 1961

*Statistical studies of recorded energy expenditure of man. Part II. Expenditure on walking related to weight, sex, age, height, speed and gradient. I. McDonald.—p. 739.

Energy Expenditure on Walking. Measurements of gross energy expenditure during walking have been collected from a large number of different publications. Initial studies of the form of the relation between energy expenditure and speed, or speed and slope, have been performed on multiple data from individual subjects. Thereafter, regression analyses were extended to the whole collection of data, equations were obtained for the estimation of energy expenditure, and tables were made of estimates from the equations. From the data for walking on the level, separate equations were found to be necessary for men and for women. For equal speeds and weights, the energy cost of walking appears to be of the order of 10 per cent less for women than for men, the exact difference varying according to speed and weight. The data on grade walking were less extensive, and equations were calculated for men only. From comparison of estimates of energy expenditure from the equations with additional data collected after the equations had been obtained, it appears that the bulk of the observations fall within ±10 per cent of the estimates.

PEDIATRICS

Vol. 28, September 1961

*Allergenicity of cow's milk. II. Studies with serum-agar precipitation technique. L. V. Crawford and F. T. Grogan.—p. 362.

Allergenicity of Cow's Milk. Raw, homogenized cow's milk and heat-denatured milk were studied. Rabbit antisera were prepared against raw, homogenized cow's milk and against heat-denatured milk as well as against bovine alpha casein, beta lactoglobulin, and alpha-lactalbumin fractions, which were used in a previous experiment. Petri dishes were coated with a layer of 1.3 per cent agar and Veronal buffer, containing thimerosal as a preservative. Diffusion of the milk antigens and the rabbit antisera occurred in the agar, and bands of precipitation were observed. Two bands of identity were obtained when homogenized milk was diffused against a bovine anticasein serum. When the same antiserum was diffused against homogenized milk and a heat-denatured milk, two bands formed against the homogenized milk, but no precipitation developed against the heat-denatured evaporated milk. Heat-denatured milk completely lost the ability to form precipitation bands with an alpha-lactalbumin antisera. This experiment indicates that most infants allergic to cow's milk could tolerate a heat-denatured milk.

PROCEEDINGS OF THE NUTRITION SOCIETY OF SOUTHERN AFRICA

Vol. 2, 1961

*Serum iron and iron stores in kwashiorkor (A preliminary communication). F. Walt.—p. 25.

*Iron metabolism in kwashiorkor. R. E. Cronje, D. J. Savage, and J. J. Theron.—p. 27.

*Serum protein response in kwashiorkor during treatment. S. M. Joubert and F. Walt.—p. 36.

*Trace elements in relation to human health and disease. J. F. Brock.—p. 47.

*Studies on the nutritive value of the mineral components of a South African fish flour, with special reference to the effect of supplementation with potassium.—D. B. du Bruyn and J. J. Dreyer.—p. 59.

*Some factors which influence the absorption and retention of calcium and phosphorus in rats on a high cereal diet. D. J. de Lange.—p. 76.

*The supplementation of maize with navy beans *(Phaseolus vulgaris)*. C. Gilbert and J. Gillman.—p. 86.

Serum Iron and Iron Stores in Kwashiorkor. Many patients with kwashiorkor become iron deficient and exhaust their iron stores during recovery. It is believed that all should be given adequate iron therapy. Oral iron is unlikely to be absorbed satisfactorily by these patients who have many deficiencies and frequently diarrhea. Parenteral iron is probably best

and should be given as soon as recovery has been initiated.

Iron Metabolism in Kwashiorkor. A mild degree of anemia is a common finding in acute kwashiorkor. The hemoglobin and mean corpuscular hemoglobin concentration frequently fall or fail to rise satisfactorily during the first few weeks of treatment. It is suggested that hemodilution occurs during the early weeks of recovery and that, while cases of kwashiorkor might be in a state of iron deficiency, at least some of them have, in addition, a defect in iron metabolism. There are two possibilities as to the exact nature of such a defect. The one is an enzymatic defect in protoporphyrin synthesis and the other a defect in iron transport.

Serum Protein Response in Kwashiorkor. The serum protein patterns of two groups of kwashiorkor patients were examined during a study in which treatment with skim lactified cow's milk (SLAM) was compared with SLAM supplemented with protein (mainly casein). The supplemented group did not show any advantage over the controls. All serum fractions, as characterized by paper electrophoresis, increased during treatment. The relative composition of the increases in serum protein fractions remained fairly constant from week to week. The relevance of these findings in relation to the problem of the effect of dietary protein on serum protein pattern is discussed. It is pointed out that "normal" serum proteins in Africans do not rule out the possibility of deficient dietary intake.

Trace Elements and Plant Proteins. Trace elements appear to influence the production of amino acids in plants and thereby influence indirectly the protein composition of plants. It has been shown that the composition of plant proteins can be controlled to a sufficient degree by proper fertilizer practice. There are an appreciable number of people in South Africa for whom maize is essentially the sole source of dietary protein. If trace mineral fertilization can be confirmed to improve the amino acid content of maize and thereby raise its biologic value, then such a program would be of value for the maize-eating community of South Africa.

Minerals in a South African Fish Flour. Studies on the nutritive value of the mineral components of a South African fish flour revealed them to be inadequate for normal growth and maintenance of health of the young rat. Supplementation of the fish flour minerals with potassium led to marked improvement in weight gain, reduction in water turnover, an increase in carcass fat content, prevention (in male rats only) of increase in heart weight, and an increase in the potassium content of skeletal muscle.

Calcium and Phosphorus and a High Cereal Diet. Absorption and retention of calcium and phosphorus and the degree of destruction of phytic acid in the intestinal tract were measured in rats receiving diets consisting almost entirely of whole wheat flour with an optimum or with a low-calcium content. The hydrolysis of phytic acid and consequently the absorption of phosphorus were greater with a low- than with a high-calcium intake, were depressed in the presence of a soluble calcium salt, and were stimulated when citric acid was added to the diet. The phosphorus retention, however, was not depressed in the presence of a soluble calcium salt, because the greater fecal loss of phosphorus was counteracted by a smaller urinary loss. The addition of citric acid to the diet led to an increase in the urinary excretion of phosphorus and, when the calcium intake was low and the phosphorus intake optimal, to an improvement in the ratio of calcium to phosphorus retained.

Supplementation of Maize with Navy Beans. Studies on the supplementation of maize showed that navy beans could be effective as a supplement to maize, provided vitamins A, D, and E and a salt mixture were also given. It was then shown that lucerne meal contains the necessary mineral and vitamin supplements to allow a diet of maize and navy beans to become effective in promoting good growth, reproduction and indefinite survival in rats. It is of considerable interest that a legume, such as lucerne meal, in a relatively low concentration (10 per cent), can effectively supplement another legume (navy beans) in the context of a maize diet.

PUBLIC HEALTH REPORTS

Vol. 76, September, 1961

*Waterborne infectious hepatitis epidemic from a chlorinated municipal supply. D. C. Poskanzer and W. G. Beadenkopf.—p. 745.

*Salmonella infantis isolated from ham in food poisoning incident. R. Angelotti, G. C. Bailey, M. J. Foter, and K. H. Lewis.—p. 771.

Waterborne Infectious Hepatitis Epidemic. An epidemic of eighty-three cases of infectious hepatitis with jaundice occurred in two neighboring New York State communities between November 21, 1956 and February 1, 1957. The two communities, although 2 mi. apart, had a common water supply. As an emergency measure, water was taken from a stream potentially subject to pollution. It was chlorinated but not otherwise treated. The distribution in time of the cases is consistent with a common-source epidemic. Milk, food, contact, insects, hepatotoxins, and parenteral inoculations appeared unlikely as common sources of infection. It is concluded that the epidemic of infectious hepatitis was waterborne through the emergency water supply, even though the water was chlorinated.

***Salmonella infantis* from Ham.** Investigation of an outbreak of gastroenteritis affecting eight members of a family revealed that the only food eaten in common was ham. Bacteriologic examination of the ham disclosed that the organisms of significance present in large numbers were *Streptococues faecalis* and *Salmonella infantis*. The contamination of ham with *S. infantis* is noted because of its rarity. The data indicate the outbreak was due to either a mixed infection of enterococci and salmonellae or to *S. infantis* alone.

QUARTERLY BULLETIN OF NORTHWESTERN UNIVERSITY MEDICAL SCHOOL

Vol. 35, Fall, 1961

*Atherogenic serum cholesterol levels and human cholesterol metabolism. R. E. Trueheart, G. E. Cox, D. Patton, and C. B. Taylor.—p. 213.

Cholesterol Metabolism. Experimental data in rhesus monkeys indicate that atherosclerotic changes develop progressively when serum cholesterol levels are above 250 mg. per 100 ml. There is no evidence for atherogenesis when serum cholesterol levels are below 200 mg. per 100 ml. Man is not able to compensate adequately for a cholesterol-rich diet. When he is placed on a radioactively labeled cholesterol-rich diet, he reaches a steady state when 31 per cent of the serum cholesterol comes from diet and 69 per cent is still synthesized endogenously by the body. It is felt that this endogenous synthesis occurs in tissues other than the liver and that the liver in man has essentially no homeostatic compensation capacity. These investigators support the hypothesis that the average U. S. citizen is continuously overloading his cholesterol metabolic pathways. This overloading leads to moderate hypercholesterolemia and atherosclerosis.

SCIENCE

Vol. 134, September 22, 1961

Effects of phenylalanine diet on brain serotonin in the rat. A. Yuwiler and R. T. Louttit.—p. 831.

*Amino acid composition of some calcified proteins. K. A. Piez.—p. 841.

Amino Acids of Some Calcified Proteins. Amino acid analysis shows that the protein from two calcified tissues, enamel and snail shell, are related to collagen in that they also contain hydroxylysine. The presence of hydroxyproline is suggested but not confirmed. This evidence, together with other recent findings, suggest that hydroxylysine may have an important role in the calcification of each of these otherwise diverse proteins.

CANADIAN FOOD JOURNAL

Vol. 2, August, 1961

*Ten tips for serving fresh fruit. C. Graham.—p. 2.

*How losses occur in restaurants.—p. 13.

*Put on a sandwich spread. M. Mulliette.—p. 18.

*What you should know about food poisoning. J. B. Morison.—p. 26.

*Citrus crystals. W. G. Coulter.—p. 32.

*"At last we've split the tray!" B. E. Lovell.—p. 42.

Serving Fresh Fruit. Ten helpful tips on serving fresh fruit include such suggestions as learning the

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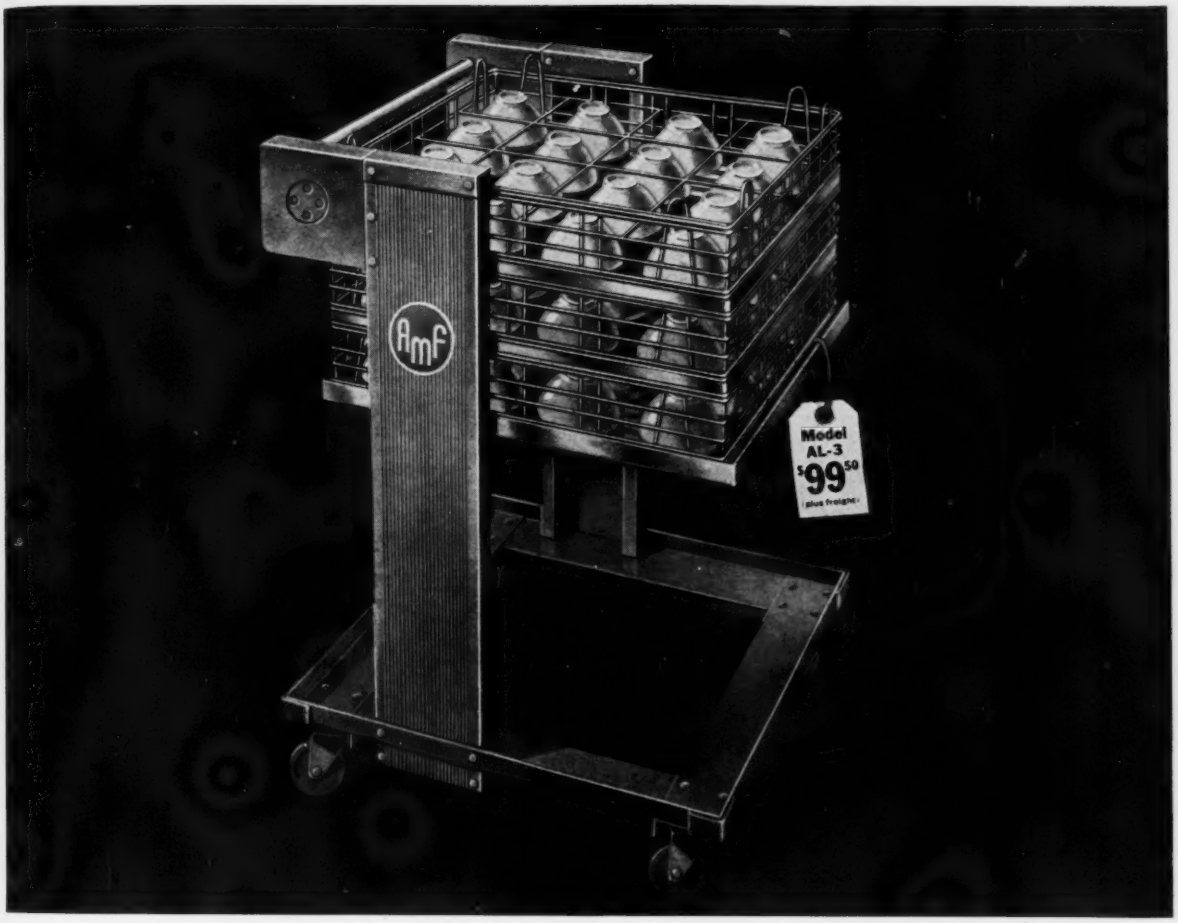

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"traits" of each fruit (for instance, cantaloupe needs about three days at room temperature to become prime eating), and using a little pure vanilla extract in fresh fruit cups to bring out natural sweetness and mellow tartness. Quantity and test (six portions) recipes are given for melon melody, rainbow, fresh pear, and plum slim salads; and a low-calorie fresh fruit cup.

Restaurant Losses. Control is the key to restaurant profits. Often the most serious leaks are those that cannot be detected easily. Money can be lost through collusion between the receiver of supplies and the deliveryman. Losses can also occur through food going out the back door (bonding companies have discovered that of all employees they bond, 25 per cent are honest, 25 per cent are dishonest, and 50 per cent are as honest as they have to be). Other losses occur through mistakes and carelessness (cooking meat at too high a temperature causing shrinkage, leftovers). Between-meal eating by employees cuts into profits, too. Checking systems to overcome these and other leaks are suggested.

Sandwich Popularity. Those restaurants realizing profits from sandwiches follow these rules: (a) spotless preparation area, (b) immaculate employees, (c) using only *fresh* ingredients—never leftovers, (d) adding quality to condiments and tasty garnishes, and (e) speedy service. Most popular in Canada are the Denver or western sandwich, the club, sliced ham, egg, and, of course, the hamburger and hot dog. Quantity recipes are included for hero, torpedo, Dagwood, and Old Smokey sandwiches.

Food Poisoning. The term, food poisoning, is limited here to those explosive outbreaks of gastrointestinal disorder following the ingestion of food with toxic substances or agents. Described are chemical poisoning (zinc, copper, lead, arsenic, cadmium, sodium fluoride, and nitrates); plant poisoning; poisonous fish and shellfish; and parasites. Also discussed are those of bacterial origin such as staphylococcal food poisoning and botulism. Salmonella infection is a gastrointestinal infection rather than a true poisoning and accounts for about 20 per cent of all cases of food poisoning. Steps in prevention are education, prevention of contamination, refrigeration, and adequate heating.

Citrus Crystals. For the first time, citrus juices possessing 96 per cent of the ascorbic acid content of fresh fruit can be obtained simply by stirring dehydrated pure juice crystals, which require no refrigeration, into water. Fifteen years and more than a million dollars of private and government funds went into research and development. Today, a Florida plant turns concentrated juice from 30,000,000 oranges and grapefruit into close to a million pounds of crystals. Work has been done, too, on lime, lemon, tangerine, pineapple, and banana crystals. The many uses of these products are pointed out.

Splitting the Tray. Food service at Memorial Hospital, Long Beach, California, is based on newer concepts of efficiency. For patient service a basic 16 by 22 in. tray is used on which two specially made and closely fitting half-trays are placed. All hot foods go on one half-tray; all cold foods on the other. Preheated and refrigerated carts, at the end on the conveyor line, take the food to the floors, where the half-trays are combined. General layout of the kitchen and work flow are pictured and described.

FOOD ENGINEERING

Vol. 33, September, 1961

*USDA process produces "quick cook" dehydrated foods. N. E. Roberts.—p. 45.

*How latest enzymes sharpen your process control. R. R. Barton and C. E. Land, Jr. —p. 85.

Quick-Cook Dehydrated Foods. Treated by the "shot-gun" technique used in making breakfast cereals, vegetable pieces have a porous structure and can then be dried to the desired moisture content in much less time than usually required in dehydrating foods. The resulting product may be rehydrated in about 5 min. compared with 15 to 30 min. for vegetables processed by ordinary dehydration methods. So far, potatoes and carrots have been the subject of experiment. Eventually, other fruits and vegetables will be used. Still to be established is the relationship between the moisture content of the partially dried piece and the pressure which should be built up in the puffing gun.

Enzymes in Process Control. Enzyme technology offers new tools for unique modification of carbohydrates, fats, and proteins; and enhancing flavor and preserving foods. For instance, cellulase can remove cellulose cloud from orange and lemon juice concentrates; in vegetable canning and freezing, it can split cellulose fibers of green beans and other fibrous vegetables to improve palatability. Lipase will modify fats in dried egg albumin, increasing whipping quality; in cheese refining, it speeds up the production process; it develops proper flavor in milk chocolate. Dextran-sucrase increases viscosity and body of sucrose-containing foods. Amyloglucosidase is used in production of crystalline dextrose from starch. Flavor enzymes should prove valuable in quantity cookery where foods are exposed to rigorous treatment during preparation and serving. Acid protease has a potential as a digestive aid and in preparing protein hydrolysates. Other enzymes are cited for their contribution to meat tenderization and in removing oxygen from dehydrated foods. Advantages of liquid enzymes are noted.

FOOD SERVICE MAGAZINE

Vol. 23, September, 1961

*Quality control made easy.—p. 43.

*The kettle is the key. J. Ivy.—p. 44.

*Don't roll out crumbs.—p. 49.

*Primer of fats and oils.—p. 54.

Quality Control of French Fries. The perfect French fry is not dependent on the grade of potato, where the potato was grown, or the variety. Quality depends more on the condition of the potato (the right sugar:starch ratio). The answer lies in the processed potato in its frozen, pre-blanched form (in which it has been properly stored for correct sugar:starch ratio, has almost all the original water content removed, has slivers and nubbins removed as they never become carbonized sediment—a prime factor in the early breakdown of fat). Such a frozen potato plus the fast-recovery electric fry kettle gives a quality-controlled product.

Electric Fry Kettles. Properly prepared deep-fried foods depend on good kettles. Such equipment has the advantage of high recovery of heat loss and accurate temperature control. The latest kettles also chalk up impressive production records, using much less fat than formerly. Thirteen models of equipment are pictured and described, including pertinent manufacturer information.

Don't Roll Crumbs. The success of today's fry kettles and prepared frozen foods can be ruined by inferior home-made breadings and batters. Commercial breading and batter mixes have the right consistency and fineness to resist grease and moisture absorption. They are properly seasoned, save fat, adhere better, and are easy to use, even for an inexperienced cook.

Primer of Fats and Oils. Information is listed for beef fat and tallows, hydrogenated lards, hydrogenated shortenings, vegetable oils, and liquid frying shortening. Points are included on what to expect from a high-quality frying fat and the care and use of fats for frying.

FROSTED FOOD FIELD

Vol. 33, September, 1961

*Accelerated freeze-drying of foods. Some European advances. T. E. Petersen.—p. 11.

Advances in Freeze-Drying. Considering the acceptability of freeze-dried foods, these problems are reviewed: rehydration ratio, discoloration, off-flavoring, vitamin loss, and heat transfer. Two basically different methods have been applied for obtaining the necessary vacuum—steam ejectors or refrigerated vapor traps backed up by mechanical pumps. Both systems are explained and accompanied by diagrams. Pictured is the freeze-drying plant installed in the British Ministry of Food Experimental Factory at Aberdeen, Scotland (designed and manufactured in Copenhagen). Also photographed is an automatic machine for packaging freeze-dried foods developed in Sweden.

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HOSPITAL MANAGEMENT

Vol. 92, October, 1961

*The space age in hospital kitchens. J. C. Scully.—p. 56.

Your inventory records. Part III. Sister M. Brigid.—p. 65.

Kitchen Space. Serving more people with less equipment can be achieved without redesigning the hospital kitchen. Use of canned and prepared foods can provide an answer. A kitchen is depicted which serves 3200 meals a day, but through elimination of preparation areas can handle 4000 meals a day. Reduction can be achieved in storage space, too. Another example of cost savings is found in a table listing vegetable price comparisons (for fresh and canned vegetables).

HOSPITALS

Vol. 35, September 1, 1961

*Examining the role of the dietary consultant. H. M. Hille.—p. 75.

Vol. 35, September 16, 1961

*Frozen foods: uses and management.—p. 93.

Dietary Consultants. These specialists give advice to personnel in hospitals to assist them in improving standards of nutrition and food service management. They are not regular staff members and thus lack the authority or administrative responsibility for making decisions and taking action; they are catalysts, stimulating action. Relationships with the hospitals needing help, the ability to "listen," and the ability to work out practical and workable solutions to problems all influence the effectiveness of the consultant as an adviser. The dietary consultant as a member of a health team is an aspect to which attention is given. It is also pointed out that making suggestions and motivating others to carry them out are quite different from actually supervising a dietary department; therefore, special training in consultation is desirable.

Frozen Foods. To illustrate effective use of frozen foods in hospital food service, procedures are described as employed at Chicago Lying-In Hospital, University of Chicago Clinics. Foods are stored no longer than one week or one month. These advantages are achieved: (a) the expense of purchasing and maintaining freezer space is minimized and (b) the possible damage to the quality of frozen foods by long storage is avoided. Items purchased include: frozen vegetables, fruits (including dehydrated apples), orange juice concentrate, and fish and seafood products. Meats and chickens are purchased fresh, portioned, and then frozen. Cooking methods are described. Policies regarding the use of frozen foods vary with each institution, and factors influencing decisions regarding their use are explored.

THE MODERN HOSPITAL

Vol. 97, September, 1961

*This study uncorked cafeteria bottlenecks. M. Gilson.—p. 142.

*New kitchen equipment saves time and space. J. Hartman.—p. 152.

Cafeteria Changes. A work simplification committee at Massachusetts General Hospital, Boston, focused attention on bottlenecks in the existing cafeteria lines and studied the advantages of self-service. As a result, a sign was posted at the cafeteria entrance to route visitors (who had been slowing up the lines). A menu board was placed outside the entrance to facilitate selection. Lunch schedules for student nurses were staggered whenever possible. Both cashiers were placed in the dining room. A sub-committee studied lunch patterns and found it advisable to use the personnel cafeteria for the student nurses and absorb the service for personnel in the general cafeteria. These changes, plus a switch to self-service, save 80 manhours per week. Sketches of the cafeteria and dining room, before and after work simplification, are included.

New Kitchen Equipment. Purveyors are making a sincere effort to produce versatile, economical, labor-saving equipment for institution kitchens. Examples are described. Included are a power dicer attachment for a power mixing machine; a circular dishwashing machine; a cold water glasswasher; a cooker-mixer; a power tilting, automatic electric, stainless metal, steam-jacketed kettle; a pressure fryer; and a self-contained fat filter.

QUICK FROZEN FOODS

Vol. 24, September, 1961

*Preparation, packaging and storage of a frozen concentrated beef stew. Part I. O. J. Kahlenberg, N. B. Webb, and H. Naumann.—p. 79.

*Canadian firm offers "liquefrozen" meals; leases microwave ovens to mass feeders. —p. 127.

Frozen Concentrated Beef Stew. Because a high quality frozen precooked beef stew appeared to offer market possibilities, a study was conducted at the Missouri Agricultural Experiment Station to develop such a product. It was compared with a canned commercial stew for quality and consumer acceptability. Results, determined by a taste panel indicated that the frozen stew was favored for its brighter color. Quality factors in both the canned and frozen stews decreased with storage at 0°F. There was little difference in the flavor of the products after ten or twelve months' storage; rancidity was not detected in any of the stews examined over a twelve-month period. Pitfalls of processing and packaging such a frozen product are discussed.

"Liquefrozen" Meals. Meals frozen by liquid nitrogen and heated by microwave ovens are new in mass feeding. Plant, school, and hospital cafeterias will be offered dinners frozen by liquid nitrogen by a Canadian firm. The frozen meals will be reconstituted by microwave ovens which the firm also leases. The new plant being readied in Toronto has a capacity of 500,000 meals a month. A simple, flat-charge basis will be used for meal costs, with prices ranging from 25 to 65 cents. Three types of lease-purchase arrangements will be offered to customers as well as a selection of forty-four different menus. For hospital feeding, there will be a selection of modified diets, prepared under the supervision of a professional dietitian. The firm's long-term plan includes an extension into the restaurant field, using this kind of service to eliminate kitchens.

PERSONNEL JOURNAL

Vol. 40, September, 1961

*Employer-employee communications. H. C. McAuliff.—p. 174.

*Extra-alternative rating technique. W. K. Kirchner.—p. 176.

Vol. 40, October, 1961

*Dimensions of leadership. E. Gross.—p. 213.

Communicating. In spite of some 1,756,000 tons of material published on the subject of "communications" within business and industry, the problem still exists. Perhaps a substantial portion of the problem can be attributed to the tendency to identify situations in terms of theories and platitudes. Several contrived illustrations highlight the failings of set rules, over-simplification of problems, and reliance on extensive explanations —all putting human relations in the background.

Rating Technique. Rating employees is a common procedure in assessing performances, determining salaries, and outlining areas of improvement. Often the "error of leniency" is encountered, and the "normal curve" of distribution of ratings doesn't exist. A solution lies in adding an extra-alternative to a three- or five-step scale *(highly superior,* superior, above average, average, below average, poor). Pilot studies in industry indicate that this technique might be of value, particularly where unskilled and untrained raters are used.

Dimensions of Leadership. Against the background of concepts of leadership and reports of studies of leadership under laboratory-controlled conditions, it becomes evident that leadership is not a unitary activity which can be reduced to a series of rules. Instead of speaking of "the leader," it is perhaps better to think of "leader behavior." The first tasks are to define goals of the organization and then clarify them; these are followed by definition and clarification of the *means* whereby the goals may be achieved (administration in the strict sense). A fourth form of leader behavior is concerned with task assignment and coordination, focusing attention on communication (such leaders are keenly aware of responsibility and may pay a great personal price in tension). Another dimension consists of relating the organization goal to the individual participant's own needs—motivation. Going beyond motivation is integration or identification—securing loyalty. The last of

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the leader behavior dimensions is the "sparking function," sensing the psychologic moment when everyone's motivation is at a maximum. Of particular importance is the realization that one man cannot and should not function in all these dimensions. It must be decided which dimension is called for by the problem at hand. There remains the task of leadership allocation—of placing men where the type of behavior in which they excel is needed.

RESTAURANT MANAGEMENT

Vol. 89, September, 1961

*Increase profits by featuring more fish and seafoods. A. Easton.—p. 63.
*Fish and seafood sauces.—p. 64.
*Frying fish and seafood the right way.—p. 72.
*Kitchen layout. N. Kirikos.—p. 77.

Fish and Seafood. Portion-controlled cuts of fish—either plain, breaded, or cooked—have eliminated the problems of high labor cost and waste. The "deep sea doodle," a 3-oz. rectangular-cut of cod or haddock the length of a hot dog roll is popular; so are fish loaves (a recipe for basic fish loaf [tuna] is included). Fifteen garnishing ideas are listed, ranging from beets to pimiento to watercress. Salad combinations that go well with fish are suggested. Hints on making mornay and Newburg sauces specify the importance of stirring with both a wire whip and a wooden spoon. Shrimp and oyster dishes in their many variations are listed, and recipes are included for shrimp marinara, broiled scallops, sole mornay, and lobster Newburg.

Fish Sauces. A two-page chart lists twenty-four fish and seafood sauces, giving the basic ingredients, recipe, directions for preparation, and type of fish for which it is suitable. Common sauces, such as lemon butter, tartar sauce, and tomato sauce, are listed as well as more unusual wine sauces, curry sauce, and anchovy and mustard sauce.

Frying Fish. Basic rules for success in frying fish and seafoods involve frying fat, preparation of food for frying, the actual frying, care of the fryer, care of the frying fat, and serving. All these phases are mentioned. A helpful chart lists frying temperature (for both fast-recovery and regular kettles) and frying time for twelve fish products.

Salad-Sandwich Department. Components of a salad and sandwich department are discussed and a preparation area sketched. A walk-in refrigerator, in or near the department, is essential. Important units are a cold direct ice pan; insert wells for dressings, pickles, and so on; a double-compartment sink for cleaning vegetables; a portable cutting board; and a pass-through refrigerator. The sandwich unit is placed at the end of the department. Work methods and the functions of a waiter in relation to this department are described.

SCHOOL LUNCH JOURNAL

Vol. 15, September, 1961

*Defrosting time of frozen turkeys. K. Longrée and L. Moragne.—p. 23.
*Special report—The American Dietetic Association.—p. 115.

Defrosting Turkeys. No information has been available on the question of whether defrosting turkeys at room temperature is a good practice from a bacteriologic point of view. Studies using frozen Empire White turkeys indicate that those defrosted at room temperature required only one-third to one-fourth the time necessary for refrigerator defrosting. However, along with other bacteria, salmonellae are found on fowl and multiply at a temperature above 42° F. Since defrosting at room temperature is bacteriologically risky, turkeys handled in this manner must be checked carefully as they near the defrosting stage and placed immediately in the refrigerator. The practice of thoroughly washing defrosted turkey prior to cooking is excellent.

Report on A.D.A. This report is the first of several on the history and activities of organizations devoted to the same basic interest areas as the American School Food Service Association. From the beginnings in 1917 to the present time, the scope of activities of The American Dietetic Association are set forth: the activities of its members, the internship program, contributions of state associations, the function of the annual convention, cooperation with other organizations, the pilot program for training food service supervisors, and the problem of "stretching" the services of members.

SOUTHERN HOSPITALS

Vol. 29, September, 1961

*Eggs hold major place in the menu. J. P. Bussart.—p. 50.

Eggs. Eggs are wholesome protein food which find a place in many menus. They are plentiful, relatively inexpensive, and readily accepted. A good source of ideas for serving eggs is found in the flyers from the Agriculture Marketing Service of the Department of Agriculture. Herbs and spices used with eggs vary the flavor and give them a "cosmopolitan" touch. Eggs are an integral part of many prepared foods. They contribute a great deal in nutritive value to our daily diet. A "good egg" needs to be properly stored under refrigeration and properly prepared.

VOLUME FEEDING MANAGEMENT

Vol. 17, October, 1961

*Job evaluation. J. Ghene.—p. 13.
*Let's serve soup. E. Blair.—p. 20.
*Peas: new ways to prepare frozen varieties.—p. 25.
*Taking the secret out of shortening.—p. 28.
*Components of design for refrigerated areas. O. Webber.—p. 49.
*Dining service stations. Product evaluation report.—p. 55.

Job Evaluation. Effective job evaluation depends, first of all, on adequate organization. Aspects of job analysis are considered and the many advantages of evaluation are pointed out. Employee satisfaction is discussed. Four ways to develop responsible workers are cited: (a) by careful placement, (b) by high standards of performance, (c) by providing the worker with information needed to control himself, and (d) by giving him managerial vision. Participation by employees in the development of company objectives and an awareness of human relations all add up to organization success.

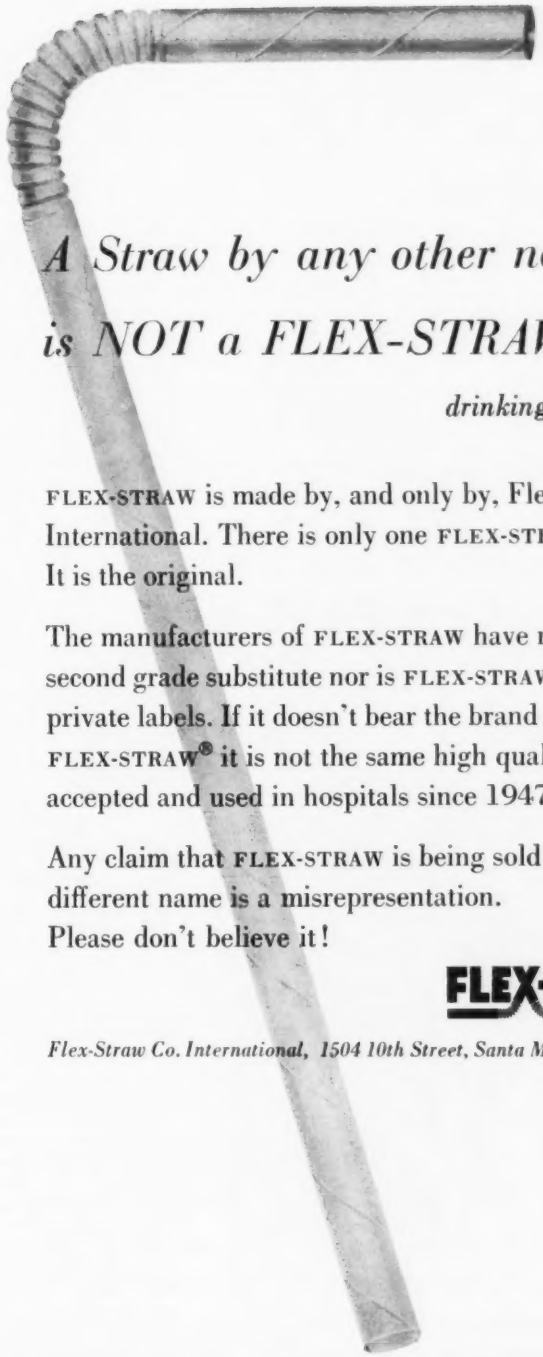
Serve Soup. Canned, frozen, and dehydrated soups and soup bases all respond to an imaginative touch, whether it be seasoning, an additional ingredient, a garnish, or method of presentation. Sherry or madeira, lemon and onion juice, a trace of sugar, herbs, or companionable ingredients are just the beginning of possibilities. Twenty-five elegant combinations are suggested (including green pea soup with chopped fresh mint or sour cream, and potato soup with slivered almonds and sherry). Fourteen quantity soup recipes are listed.

Frozen Peas. Frozen peas lend themselves to easy and effective preparation. Directions are given for cooking in a sauce pan or steam-jacketed kettle and in a steamer or pressure-steamer. On the menu, though they are most often served alone seasoned with butter, salt, and pepper, peas can be distinctive as part of a salad (marinated), combined with other vegetables, varied with herbs and seasonings, and sparked with numerous garnishes. Lists of such combinations are included.

Using Shortening. Choice of fats is based on all-around menu planning. Will the same shortening be used for baking and frying? Shortening requirements are enumerated for: deep-fat frying; pie dough; cake baking; breads, rolls, biscuits, and muffins; Danish pastry; puff pastry; and sauces. A chart is incorporated in the article listing the basic types of shortenings.

Designing Refrigerated Areas. It is still a common habit to erect a refrigerator on top of the kitchen floor. This requires a 6- to 8-in. step-up and presents a great waste of time; it is also physically exhausting, particularly for women employees, as all food must be lifted and carried manually. Another problem is trying to close a heavy, full-width door on a confined chilled room. Detailed components of design for refrigerated areas are sketched, including a floor depressed at least 8 in. in the slab, and double doors meeting without any center post.

Evaluating Dining Service Stations. Dining service stations are efficient, keeping waitresses out of the kitchen and reducing traffic and confusion. There are three types: (a) a long



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counter, almost a complete pantry; (b) a kitchen pass-through, particularly suitable for coffee shops; and (c) dining room sub-stations. Location is discussed along with equipment, construction, maintenance, design factors, additional uses of equipment, and design trends.

WHAT'S NEW IN HOME ECONOMICS

Vol. 25, October, 1961

*Work simplification for handicapped mothers.—p. 46.

*With a little imagination. K. Pennington.—p. 56.

*Nutrition of the mother-to-be. D. Nicoll.—p. 58.

*Home economists can do something about poorly planned kitchens in builder-built homes. A. C. Ludwig.—p. 60.

*The electronic range—a timesaver?—p. 66.

Work Simplification for the Handicapped. In 1960, a five-year project aimed to devise work simplification procedures for handicapped homemakers was completed by the School of Home Economics, University of Connecticut. The method of procedure is outlined briefly. Over fifty representatives from health organizations made up the research committee. Pilot studies involved the problems of 100 orthopedically handicapped mothers and studies of work simplification in home situations. Problem areas indicated by the pilot studies included physical care of preschool children, self-help clothing and play materials for these children, work simplification in food preparation and laundry problems, and family cooperation in the care of young children.

Gourmet Recipes. Recipes selected for presentation here are a happy blend of cultivated taste, subtlety, flair, and elegance. Included are family-size recipes for hot pink soup (adaptation of borscht), delicious pea soup and cheese velvet soup (both made in a blender), apple flan, and blushing pears with bay-leaf sauce.

Nutrition of Mother-to-Be. One out of every four mothers bearing a first child is less than twenty years old. This is only one of many facts which make nutrition education during pregnancy a matter of concern. Nourishment demands during the various stages of pregnancy are explained. Five positive steps are outlined which should be noted by all those related to the health professions in an effort to disseminate adequate nutrition information to mothers-to-be.

Errors in Kitchen Planning. Principles of kitchen planning have been presented by home economists for a number of years, but it is amazing how little of this information has filtered through to architects and builders. This article and another appearing simultaneously in *American Builder* are the first steps in the direction of correcting the problem. Builder readers are being told to ask utility home service directors to organize workshops in kitchen planning for local builders, contractors, and architects; to check their plans with the home service director, the home demonstration agent, and/or the local high school teacher of home economics. Included in the article are points to check in a kitchen plan—the home economist remembering she is functioning not as an architect or builder but as a homemaker.

The Electronic Range. A comparative study of the use-value of the electronic range and the conventional range was made at Iowa State University. A survey of homemakers who owned electronic ranges indicated that they were chosen for time-saving, while the conventional range was selected for quality of product, and small equipment (electric frypan) for convenience. Owners indicated that they used the electronic range most frequently in preparing breakfasts and dinners. These meals were chosen for a laboratory study. It was found that: the electronic range was advantageous in preparing frozen green and yellow vegetables; pans and baskets could be handled without pot holders; foods could be heated without decreasing moisture within the product; speed of thawing frozen foods fits well in hurried schedules, and the range was exceptionally easy to clean.

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Meeting on Quackery. The first National Congress on Medical Quackery, sponsored by the American Medical Association and Food and Drug Administration, was held in Washington, D. C., on October 6 and 7. Those taking part in the program included officials from federal agencies and the A.M.A.; representatives of voluntary and private organizations involved in the health field; and members of law enforcement agencies.

Dr. Leonard W. Larson, President of the A.M.A., in welcoming the Congress, expressed the desire of the A.M.A. to work more closely with the federal government, the state and local governments, and private and voluntary organizations in more effective law enforcement as well as a stepped-up campaign of public education.

The A.M.A.'s Department of Investigation conceived the Congress as a springboard for a vigorous, multi-faceted attack on quackery. Since its founding in 1906, the Department of Investigation has accumulated the largest files existent on medical quackery. This Department collects its information through original investigations, data received from federal sources, state and municipal boards of health, published information, reports of commissions, and so on. The more than one million references in these files have enabled the Department to serve as a clearing house for information on quackery.

The work and scope of activities of the federal agencies were described by Herbert J. Miller, Jr., of the Department of Justice; Dr. George P. Larrick, FDA Commissioner: W. W. Goodrich, FDA General Counsel; the Honorable Paul R. Dixon, Chairman, Federal Trade Commission; and the Honorable J. Edward Day, Postmaster General.

Nutritional quackery, a billion-a-year business, was described as one of the smoothest and best organized rackets in the country by Dr. Fredrick J. Stare, Chairman, Department of Nutrition, Harvard School of Public Health. Milton P. Duffy, Chief, Bureau of Food and Drug Inspections, California Department of Public Health, reviewed some of the experiences encountered in the control of quackery in California. Dr. Harold E. Jervey described the activities of the Federation of State Medical Boards of the United States; and Morris Fishbein, M.D., pointed up the responsibilities of science writers and editors.

Dr. R. W. Lamont-Havers, Medical Director, Arthritis and Rheumatism Foundation; Dr. L. Henry Garland, American Cancer Society; and Maye A. Russ of the National Better Business Bureau described the points of attack which have been made by these organizations in fighting quackery.

From this multi-faceted approach, participants of this Congress gained a widened appreciation of the potentialities for more effective cooperation of medical, governmental, and private and voluntary agencies in the prosecution of the quack and the stepped-up education of the public.

All were in accord with Dr. Larson's sage advice as published in the October 8, 1961 issue of *This Week:*

(a) Learn the signs of quackery, so that no charlatan can fool you.

(b) Hold on to your money until you have investigated the scientific background and the claims of all medical offers.

(c) When in doubt, write for information to: the American Medical Association, the Food and Drug Administration, the Post Office Department, the Federal Trade Commission, your state or local health department, your state or county medical society, or your family doctor.

(d) Cooperate with enforcement officials by furnishing information and by being willing to testify when you have been cheated.

The hope was voiced by many that this first National Congress on Medical Quackery would serve as a pattern for a series of conferences and programs at the state and local levels to spotlight the work of the quack and to bring about closer cooperation of law enforcement agencies and health organizations concerned with the education of the public.

Dr. Bricker Appointed to FDA Advisory Committee. A sixteen-member Citizens Advisory Committee to study the kind of consumer protection which the Food and Drug Administration should supply in the years ahead has been appointed by Secretary of Health, Education, and Welfare Abraham Ribicoff. The committee will make recommendations regarding steps which the Department and the FDA should take to insure adequate protection to citizens in their use of foods, drugs, therapeutic devices, cosmetics, and household chemical products. The study will be conducted as a new appraisal of problems of consumer protection, rather than as a continuation of a study made by a similar committee in 1955. Included as members of the new Citizens Advisory Committee are: Dr. June Bricker, A.D.A. Speaker of the House of Delegates and Executive Director, American Home Economics Association; Dr. W. J. Darby, Head, Department of Biochemistry, Vanderbilt University School of Medicine, Nashville; and Dr. Conrad A. Elvehjem, President, University of Wisconsin, Madison.

Journals Donated to University. The family of Lenna Frances Cooper recently presented to Western Michigan University, Kalamazoo, Miss Cooper's complete set of bound copies of this JOURNAL. Presentation to Dr. Russell Seibert, Vice-President of the University in Charge of Academic Affairs, was made by Regina Frisbie, Director of Home Economics Services, Kellogg Company, Battle Creek, Michigan.

Plentiful Foods — MONTHLY LIST

The following foods, according to the USDA, will be in plentiful supply during December:

Protein foods

Chickens—broilers and fryers
Peanuts and peanut products
Pork
Turkeys

Other foods

Almonds
Apples
Cranberries
Honey
Grapefruit, fresh
Pecans
Vegetable fats and oils

Frozen Foods in December. December is festival month—a time for delight in gay, holiday-season meals. To help menu planners, the National Association of Frozen Food Packers has supplied the following suggestions for this month.

Frozen Fruits

APPLES—These are of fine quality. When serving as applesauce, add frozen concentrated lemonade for a flavor accent. Serve as a dessert with a topping of colorful whole frozen strawberries and golden frozen peach slices.

CHERRIES—Cobblers and other desserts made from frozen cherries provide colorful end-of-the-meal climaxes. Frozen cherries slightly thickened with cornstarch (no sugar added) make a wonderful warm sauce for ice cream.

PEACHES—Frozen halves have rosy centers and good firmness; a delight as a fruit dessert by themselves. Or, use for peach melba or in fruit pastry desserts of all kinds.

RASPBERRIES—Another fruit to add red to the menu. Use in small amounts with other fruits for color accents, or as the main ingredient of a dessert.

Frozen Vegetables

BEANS, LIMA—Join with frozen cut corn in a sauce of cream and butter for a delicious succotash combination.

BRUSSELS SPROUTS—Serve with lemon butter on busy days, with Hollandaise when there is more time. But, don't overcook or allow to stand in water after cooking!

CAULIFLOWER—Another vegetable that is good with lemon butter.

PUMPKIN AND SQUASH—Pumpkin custards are favorites with calorie-counters. Cooked winter squash may be served in many ways: add spices and brown sugar when served

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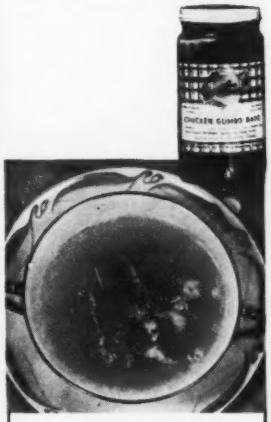
CUSTOM SOUP BASES



CREOLE CHICKEN GUMBO SOUP
50 servings—8 oz. each

- 2 14 oz. jars Custom Chicken Gumbo Base
- 3½ gallons boiling water
- 1 #10 can tomatoes
- 2 bay leaves (whole)

Method

1. Add Custom Chicken Gumbo Soup to boiling water, stirring well.
2. Mash or cut up solid pieces of canned tomatoes and add entire contents to simmering soup.
3. Add bay leaves and continue cooking for 30 minutes.
4. Remove bay leaves and serve very hot.

Cost per Serving . . .03¢
Approx. Selling Price .35¢
YOUR PROFIT 32¢

CHINESE ONION SOUP
50 servings—6 oz. each

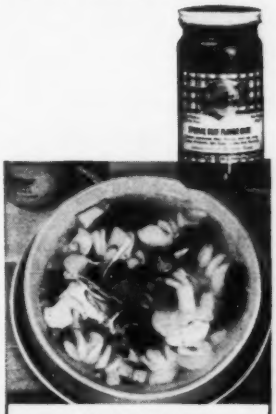
- 2-8 oz. jars Custom Onion Base
- 2½ gals. boiling water
- 3 large stalks Chinese cabbage (celery cabbage)

Method

1. Add Custom Onion Base to boiling water.
2. Stir well and simmer for 15 to 20 minutes.
3. Cut stalks of Chinese Cabbage cross ways in very thin slices — rinse well in cold water, drain and add to simmering onion soup during last 5 minutes of cooking. The vegetable should be crunchy. Do not over cook.

NOTE: Thinly sliced buds of raw cauliflower may be used instead of the celery cabbage but will add to the cost.

Cost per Serving . . . . .2¼¢
Approx. Selling Price .30¢
YOUR PROFIT 27½¢



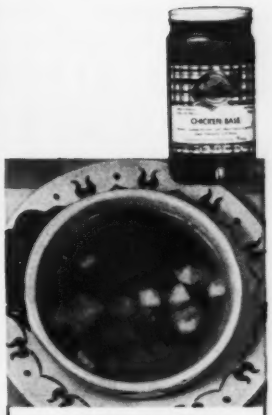
MINESTRONE
50 servings—8 oz. each

- 1-1 lb. Custom Special Beef Flavor Base
- 4 gals. boiling water
- 1½ tbsps. salt
- 1 tsp. pepper
- 1 qt. each — chopped onion, diced celery, shredded cabbage, diced carrots, peas, diced potatoes, red kidney beans (canned) tomatoes — fresh or canned
- ¼ cup chopped parsley
- 1 tsp. ground sage
- 2 lbs. ditalini or tubettini style macaroni
- Parmesan cheese as needed

Method

1. Combine Custom Special Beef Flavor Base with boiling water — stirring well. Simmer for 15 minutes.
2. Add seasonings, vegetables and macaroni.
3. Simmer until vegetables are tender — about 15 minutes.
4. Check for seasoning.
5. Sprinkle each serving with cheese.

Cost per Serving . . . . .04¢
Approx. Selling Price .35¢
YOUR PROFIT 31¢



CHICKEN HURRY SOUP
50 servings—6 oz. each

- 2-1 lb. jars Custom Chicken Base
- 2 gallons boiling water
- 1 quart diced tomatoes (½ inch)
- 1 #10 can kidney beans
- Chopped chives as needed

Method

1. Combine Custom Chicken base with boiling water.
2. Stir well over heat and bring to boiling.
3. Reduce heat and simmer for 20 minutes.
4. Add well rinsed kidney beans and continue cooking for 10 minutes.
5. Just before serving add diced tomatoes.
6. When serving stir well before ladling.
7. Top each serving with small amount of chopped chives for garnish.

Cost per Serving . . . . .03¢
Approx. Selling Price .30¢
YOUR PROFIT 27¢

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with ham, or dress it up with onion salt, pepper, and butter as an accompaniment for beef.

Nutrition Conference. "Aspects of Human Nutrition" was the theme of the seventh annual nutrition conference held at Wayne State University College of Medicine, Detroit, on November 10. The program included:

"Aberrations in Nutrition Resulting from Genetic Defects"—R. G. Hanson, Ph.D., Michigan State University

"Nutrition in Clinical Medicine"—Robert E. Hodges, M.D., State University of Iowa

"Nutrition and Mental Disease"—M. K. Horwitt, Ph.D., Elgin (Illinois) State Hospital

"Nutritional Problems in National Disasters"—Herbert Pollack, Ph.D., M.D., New York University

Land Grant Centennial Conference. On November 3 and 4, a Land Grant Centennial Conference on Nutrition was held at Virginia Polytechnic Institute, Blacksburg, in connection with the dedication of a new Biochemistry and Nutrition Building. Noted nutrition scientists, nutrition educators, and leaders in the public health field participated. Discussions covered: the nutritional requirements of man, animal nutrition research and the contributions of animal agriculture to human health; governmental nutrition research programs; processing of foods, food additives, and their relation to human nutrition and health; and nutritional health at home and abroad. Joint sponsors of the conference were The Nutrition Foundation, the National Dairy Council, and the Virginia Agricultural Experiment Station at Virginia Polytechnic Institute.

Symposium on Blood Cell Formation. Another meeting of interest was a symposium on "Nutritional and Metabolic Aspects of Blood Cell Formation" held October 20 at the University of Arkansas Medical Center, Little Rock. The program featured:

"The Utilization of Iron in Erythropoiesis"—Dr. Elmer B. Brown, Washington University, St. Louis

"Some Metabolic and Nutritional Factors Affecting the Survival of Erythrocytes"—Dr. H. N. Marvin, University of Arkansas

"Erythrocyte Survival During Tocopherol Depletion in Man"—Drs. M. K. Horwitt, B. Century, and A. A. Zeman, Elgin (Illinois) State Hospital

"Thiamine Deficiency and Erythrocyte Metabolism"—Dr. Myron Brin, State University of New York, Syracuse

"Some Nutritional Considerations Concerning Vitamin B_{12} and Folic Acid"—Drs. Richard Bozian and William J. Darby, Vanderbilt University, Nashville

"Studies on the Interrelationship of Folic Acid, Ascorbic Acid, and Vitamin B_{12}"—Dr. Richard W. Vilter, University of Cincinnati

Government Booklets. Marguerite C. Burk, Agricultural Economist of the USDA's Economic Research Service, has authored Agriculture Handbook No. 206, *Measures and Procedures for Analysis of U. S. Food Consumption.* This report goes a step beyond previous releases in that it considers concepts underlying various alternative measures of over-all food consumption, both through time and among major population groups at one point in time. It also describes special procedures developed for analysis of problems related to food consumption. Chapter headings in this 117-page report indicate the content: "Ways of Looking at Food Consumption," "Economic Measures of Food Consumption," "Introduction to Procedures for Analysis of U. S. Food Consumption." This report is sold by the Government Printing Office, Washington 25, D.C., at 60 cents a copy.

A companion release, Agriculture Handbook No. 214, *Trends and Patterns in U. S. Food Consumption*—also authored by Miss Burk—provides further data to form a comprehensive picture of major historical changes in U. S. food consumption. It summarizes selected data pertaining to major commodities. The chapters, graphs, and tables supply information on "Changes in the Sources and Uses of U. S. Food Supplies," "Changes in Average Food Consumption," "Variations in Food Consumption Among Population Groups," "Variations in Use of Marketing Services," and "Changes in the Value of Food Consumed." This report also costs 60 cents a copy and should be ordered from the Government Printing Office.

Consumption Trends and Patterns for Vegetables . . . Potatoes, Sweet Potatoes, Dry Beans, and Peas is a third new USDA booklet. It carries the number, Agriculture Handbook No. 215, was prepared by Gertrude Gronbech, and is the second handbook in a series on consumption trends and patterns for major food groups. Data apply to forty-eight states, but not to Alaska and Hawaii. Data are presented in both graphic and tabular form. The trend, since World War II, has been for increased use of processed vegetables, which has been offset by a decline in the use of fresh vegetables. Larger quantities of vegetables per person are, in general, eaten by urban households than by rural families, and high-income groups tend to use more than lower-income groups. Geographically, the West consumes the largest quantity of vegetables per person, followed by the Northeast, the North Central Region, and the South. In contrast to vegetable use, urban households use less potatoes and dry beans and peas. No substantial change in per capita consumption of vegetables and potatoes is anticipated in the next decade, although more

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Carbohydrate.....0.3 Gm.
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(Unsaturated Fatty Acids.....3.6 Gm.)
Also present, vitamins A, D, E, K, B_1, B_2, B_6, B_{12}, Pantothenic Acid, Niacin, Folic Acid, Biotin, and many essential minerals.

Few foods known to man provide a higher ratio of nutrient value to calories than do eggs.

The quality of egg protein is a standard against which the proteins of other foods are measured.

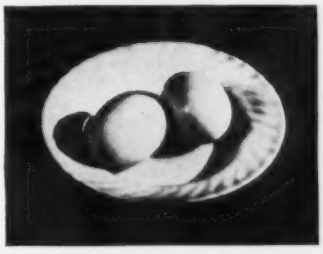
The cholesterol and fatty acid contents of two eggs—traditionally a widely preferred breakfast—fit well into the daily diet, even when lessened fat intake is recommended.

Because of their high nutrient value, their easy digestibility, compatibility, and nutritional complementation of other foods, eggs are included in the recommended dietary* for many conditions in which diet adjustment is indicated.

Eggs are listed in the daily recommendations of nourishing liquid, restricted fiber, low sodium, restricted purine, low-calorie, and many other diets.

**Recommended in the diet manuals of teaching institutions.*

The nutritional statements made in this advertisement have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current authoritative medical opinion.



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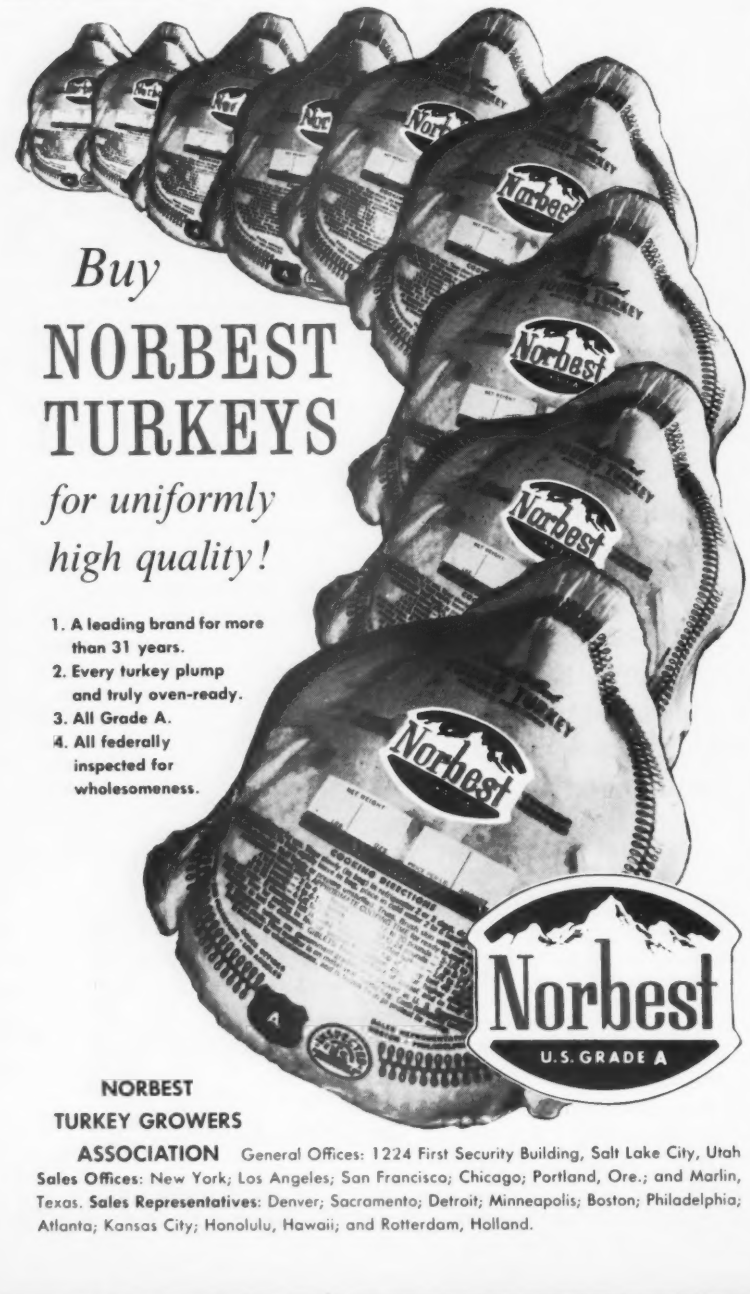
processed forms may be used. Copies of this report may be ordered from the Government Printing Office for 40 cents each.

The Children's Bureau of the Department of Health, Education, and Welfare has published a new booklet on "Phenylketonuria" by Willard R. Centerwall, M.D., and Siegried A. Centerwall, M.D. (Children's Bureau Publication No. 388). Some of the approaches to screening, early detection, and treatment of this condition are described, including dietary treatment. The exchange lists for a low-phenylalanine diet developed by Acosta and Centerwall and first published in this JOURNAL, are reprinted in an appendix. A bibliography of more than fifty references is also supplied. This booklet is available from the Government Printing Office for 15 cents a copy.

The Food and Drug Administration's popular booklet, "Read the Label on Foods, Drugs, Devices, Cosmetics, and Household Chemicals," has re-recently been revised for the third time. In it, FDA regulations regarding full and honest disclosure on labels of food products are explained, with cartoon-type illustrations to emphasize such important points as the concept of definitions and standards of identity in relation to foods. Similar information is provided for drugs and medical "devices" and cosmetics. Copies of this booklet may be ordered from the Government Printing Office for 20 cents each.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New Booklets. A food booklet to help public assistance recipients manage their food budgets for maximum nutritional benefits is available from the Cook County Department of Public Aid, Chicago. Titled "Good Meals on a Small Budget," information is presented on a daily food plan, time and money savers, weekly menu plan, a week's shopping list, recipes, lunch box suggestions, weights and measures, and correct table setting. There are also tips on buying and food storage. Copies may be requested from the Home Economics Service, Cook County Department of Public Aid, Room 510, 69 West Washington Street, Chicago 2.

"Concentration of Selected Constituents in the Blood of Healthy Women 30 to 90 Years of Age in Six North Central States," is the latest contribution from the North Central Regional Co-operative Project NC-5. Values for hemoglobin, red cells, total and differential leukocytes, serum protein, calcium, phosphorus, and glucose of several hundred healthy women in six states tended to be slightly lower than values given as standards in textbooks. Differences between age groups were not significant. This report is published as Nebraska Research Bulletin 198 and North Central Regional Publication 121. Copies may be obtained from the Nebraska Agricultural Experiment Station, Lincoln.

News of State Associations

Colorado Dietetic Association. In June, the Colorado Association cosponsored, with the Colorado Hospital Association, a Diet Therapy Workshop in Denver. Attendance, totaling sixty-two persons, was drawn from Colorado, Kansas, Nebraska, and California. The program was designed to bring dietitians up to date on the dietary treatment of the patient with diabetes, allergy, ulcer, cardiac disorder, and renal disease.

The September meeting of the *Pueblo Dietetic Association* featured a talk by Ortu B. Jones, Instructor of Psychology, on "Human Relations."

In *Denver*, Dr. Samuel Bukantz, Medical Director, National Home for Asthmatic Children, spoke to the local group in September. His subject was "Newer Treatment of the Asthmatic."

Georgia Dietetic Association. A travelog of "A Trip around the World in Forty Days" by Marjorie Massee entertained members of the *Atlanta Dietetic Association* at a recent meeting. New officers of the Atlanta group are: President, Charlotte Jackson, Emory University School of Nursing; President-Elect, Etta E. Severin, VA Hospital; and Secretary-Treasurer, Mary Ojeda, Methodist Children's Home.

The *Augusta Dietetic Association*

NEW! Merimix

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IT'S DELICIOUS! Made from real eggs and only the highest quality ingredients (absolutely no fillers), Merimix has the same full flavor, smooth texture and inviting appearance of the finest egg custard made the long, hard way!

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IT'S A DELIGHT TO EAT! Definite preference for Merimix over the standard custard recipe was established in expert food-taste panel and consumer testing conducted by Wisconsin Alumni Research Foundation. For the "acid test", Merimix was taste-tested by 104 hospital dietitians and served to over 5000 hospitalized patients. – The overwhelming vote was: Merimix is a delight to eat!

AVAILABLE in 5 lb. double polyethylene, foil lined bags sold singly or cases of six 5 lb. bags. Bag need not be refrigerated after opening. Each 5 lb. bag makes 100 four-ounce servings – simply add water, mix and bake; quantity directions are on the package and thoroughly tested for consistent results. For many appetite appealing variations, write for our tested quantity recipe cards – rice custard, caramel custard, creme brulee, coconut custard, bread pudding and custard pie. Cost per 4 oz. serving of Merimix custard: approximately 6¢ (based on case price).

Order from your local institutional grocer today, or if he doesn't have Merimix (it's new!)—order from us and we'll ship direct and bill through him.

Merimix® **REAL EGG CUSTARD** *Another Fine Product of* **THE DIETENE COMPANY** Minneapolis 16, Minn.

met in September to review the work of the past year. Officers for 1960-62 are: President, Sarah Morris, VA Hospital; President-Elect, Shirley Schilling, Barrett School of Nursing, University Hospital; and Secretary-Treasurer, Anne Hamilton, VA Hospital.

Indiana Dietetic Association. Indiana dietitians met on November 8 at Ball State Teachers College, Muncie, for a dinner. Speaker of the evening was Joseph William Hollis, Associate Professor of Education at Ball State, whose subject was "Leadership Development."

Minnesota Dietetic Association. Minneapolis was the scene of the fall meeting of the Minnesota Dietetic Association on November 10. The program featured:

"Current Research Trends in Human Nutrition"—Dr. Lura Morse, Associate Professor of Home Economics, University of Minnesota

"Gastric Surgery and Dietary Follow-up"—Dr. Charles Rea, Surgeon, and Margaret Drey, Therapeutic Dietitian, both of St. Joseph's Hospital, St. Paul

"The Place of Food Management in a Hospital" — Elizabeth Lippincott, Hospital Food Management, Inc., Philadelphia, and a panel of discussants

Betty Boyer, Minneapolis General Hospital, also gave a report on the Third International Congress of Dietetics held in July in London.

Officers for Minnesota for 1961-62 are: President—Betty Priggie, University of Minnesota Hospitals, Minneapolis; President-Elect—Sister Rose Alma, St. Joseph's Hospital, St. Paul; Secretary—Grace Clark, VA Hospital, Minneapolis; and Treasurer—Ramona Sederberg, St. Mary's Hospital, Duluth.

Mississippi Dietetic Association. November 10 and 11 were the dates of the sixteenth annual meeting of the Mississippi Dietetic Association, held in Jackson. The program included:

"Happy Food Experiences for Children"—Helen Hille, Children's Bureau, Washington, D. C.

"Nutrition Fads and Fallacies"—Dr. D. J. Vanlandingham, Mississippi State Medical Association

"Communications in Human Relations"—Dr. D. B. Roark, Yazoo

"Nursing Home Services"—a panel discussion

Edith Fae Cook, as the state's delegate, reported on highlights of the Annual Meeting of The American Dietetic Association held in St. Louis in October.

Concurrently, a meeting of food service supervisors was held. The following topics were discussed: personal appearance, problems encountered as a food service supervisor; and dietary expenses in the hospital.

Missouri Dietetic Association. The fifth Dietary Institute for Food Service Supervisors was held October 4 and 5 at the Missouri Medical Center, Columbia. The Missouri Dietetic Association was a co-sponsor of this meeting, together with the Missouri Division of Health and the Missouri Hospital Association.

An annual event in which the *St. Louis Dietetic Association* cooperates is a Diabetic Dinner sponsored by the St. Louis Diabetes Association. Last spring, 370 people attended. As each guest arrived, he was interviewed by a dietitian and physician who helped to determine the amount of food he would select for his meal. Following the dinner, a food demonstration and open forum were held.

New York State Dietetic Association. New York, New Jersey, and Pennsylvania dietitians joined in presenting four meetings at the National Hotel Exposition in New York City, November 6 and 7. The topics for the meetings were: "Improving Labor-Management Relationships in Food Operations" (sponsored by the *Greater New York* and the New York State Association); "Centralized vs. Decentralized Food Service" (sponsored by the New Jersey Association); "Imagination and Creativity in Food Presentation" and "Your Food and Public Relations." The latter two programs were presented by the Pennsylvania Dietetic Association and took the place

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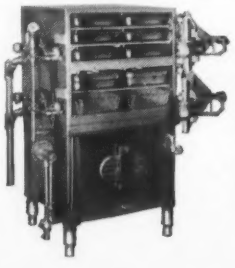

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When consumed in suggested amounts . . . two glasses daily for adults . . . milk or its equivalent in milk products provides two-thirds of the 0.8 gram of calcium recommended for maintenance, plus two-fifths of the riboflavin, one-fourth of the protein and important amounts of vitamin A, thiamine and other nutrients. If credited with the value of the other nutrients it contains, milk is by far the most economical source of calcium available.

During the middle and later years of life, changes take place in the body which may have an adverse effect on calcium metabolism. The formation of stones containing calcium and other salts which may block the urinary tract is affected by several known factors including sex, race, and geography. The consumption of recommended amounts of *dietary calcium* has not been found to be associated with the development of *urinary calculi*. In some cases of osteoporosis . . . the most common bone disease in women of middle age . . . a liberal calcium allowance may be a valuable adjunct to hormonal therapy in stimulating recalcification of demineralized bone!

Milk and other dairy foods stand alone in their ability to provide calcium needed by adults of all ages in a form that is highly palatable, easily digested, and readily absorbed . . . and they also provide other nutrients which contribute to a balanced dietary and buoyant health.

The nutritional statements made in this advertisement have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current authoritative medical opinion.

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NEW CALORIE-RESTRICTED DIET SHEETS

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of the annual fall meeting of this group. Helen Cassidy, St. Luke's Hospital, New York City, served as chairman of the Dietitians' Committee for the Exposition.

The opening meeting of the 1961-62 year for the *Greater New York Dietetic Association* was held September 18. The theme of the program was: "Dietetics Is International." Alliene Mosso summarized the highlights of the Third International Congress of Dietetics in London in July; Sheila Cronin spoke on training foreign dietitians for service at home; and Helen Corzine discussed inborn errors of metabolism.

The *Mohawk Regional Dietetic Association* met in September to hear Alice Hay, St. Luke's Memorial Hospital, Utica, discuss "The Effect of Folic Acid in the Body."

Virginia Dietetic Association. Erna Mae Behrend has been named the 1961 winner of the John G. Kolbe Award of the Virginia Dietetic Association. Miss Behrend's honor was made in recognition of her contributions to the Association and her community, and for her accomplishments in her position as Nutritionist, A. D. Williams Memorial Clinic, Medical College of Virginia.

The Civil Defense Committee of the *Richmond Dietetic Association*, with the help of the Subsistence Department, Quartermaster School, U. S. Army, Ft. Lee, sponsored a two-day emergency mass feeding course last spring. Twenty-six persons, including dietitians from Richmond and other parts of the state, participated in the exercises. An actual outdoor "messing" area was constructed on the first day, while on the second, cooking teams prepared lunch on "expedients" similar to those constructed the day before.

Washington State Dietetic Association. On November 17 and 18, the Washington State dietitians met in Tacoma for their annual fall meeting. Highlights of the program included the latest developments in disaster preparedness (a follow-up of a Civil Defense workshop held last March), and a discussion on food technology, with the newest trends in food service and food processing being spotlighted. Reports of the Third International Congress on Dietetics in London in July and of the 44th A. D. A. Annual Meeting in St. Louis in October were given.

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Association Activities

A.D.A. Representatives at State Meetings. Representatives from the national Association attended the following state dietetic association meetings this fall:

September 28—Helen G. Ingerson, *New Hampshire*, Concord
November 3—Evelyn A. Carpenter, *Maine*, Portland
November 8 to 10—Adelia M. Beeuwkes, *Florida*, Tampa
November 9 to 11—Edith Fae Cook, *Mississippi*, Jackson
November 10 and 11—Ethel A. Downey, *West Virginia*, Huntington
November 16 to 18—A. June Bricker, Ph.D., *Louisiana*, Shreveport
November 17 and 18—Evelyn A. Carpenter, *Arkansas*, Little Rock
November 17 and 18—J. June Stein, *Montana*, Bozeman

1962 A.D.A. Annual Meeting. The 45th Annual Meeting of The American Dietetic Association will be held October 9 to 12 in Miami Beach, Florida. Plan now to be with us.

Obituaries

Eleanor I. Tanaka, The A. D. A. office has been notified of the death of Eleanor I. Tanaka on June 30, 1961. She was a graduate of Santa Barbara College of the University of California, and completed an internship at Good Samaritan Hospital, Portland, Oregon. She had been a member of the Association since 1951.

News of Products and Services

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of special portable units, *Lincoln Manufacturing Co., Inc.*, has introduced the Lincoln OTD-33, said to function as a complete system for transporting all popular size dishes, trays, and pans, as well as bulk milk cans and banquet-style dishes with dome covers. Sliding, stainless steel dividers compartmentalize the unit to the desired size. It will accommodate 10 by 14 in. or 14 by 18 in. trays, as well as bowls and dishes. The unit is available with a vinyl see-through cover to protect its contents during transportation and in storage. Other features are stainless steel construction, rubber-tired swivel wheels, and rigid frame design for finger-tip control.

The latest Lowerator Dispenser, AL-3 for cups, glasses, and trays, is described in a leaflet from *American Machine & Foundry Company*. The leaflet presents features and specifications, including details on the unit's construction and operating mechanism, data on capacities, size, weight, casters, bumpers, and ease of adjustment.

The *Steril-Sil Company* is featuring "Tri-Lok," a special telescoping cylinder, which is said to hold all silver sizes. The "down" position spreads the silver for maximum washing efficiency, a mid-range is used for improved dispensing of short pieces, and the fully extended position is for tumbling, transporting, and dispensing. The cylinders are made of tough, lightweight Delrin that will not discolor, go "out of round," or become dented. They will withstand temperatures exceeding 300°F. and are impervious to acids or alkalis.

The new Mark-Line Steam Cookers of *Market Forge Company* feature modular base units in four sizes, on which any combination of Market Forge Steam-Its, compartment cookers, 10- and 20-qt. tilting kettles, and 30- and 40-gal. stationary or tilting kettles may be assembled. Over thirty arrangements are possible.

A new line of heavy-duty gas pizza ovens, especially designed for stacking, has been introduced by *Bakers Pride Oven Co.* The units are for the volume baker. All units are made with adjustable top and bottom heat controls and carry National Sanitation Foundation and Gas Association approval. Model DS-990 is finished with complete stainless steel front doors and legs. It will bake sixteen 12-in. or ten 16-in. pizzas every 4 min. on its two 2-in. brick hearths. For pan baking, the oven will hold twenty-four 12-in. or twelve 16-in. pizzas. The unit may be equipped for any type of gas.

A mobile, automatic electronic range, Model B-2, is offered by *Mobile Kitchens, Inc.* The unit has four-plate capacity. No pots or pans away from the kitchen are necessary. Food may be heated in serving dishes of paper, glass, or china and served piping hot directly from the range. Frozen or refrigerated foods are reconstituted in seconds.

Fortified Soyamel, a vitamin- and mineral-enriched powdered soy milk, has been developed by *Worthington Foods, Inc.* Available in instant, malt, powdered, and fortified powdered form, it may be used like cow's milk as a beverage or for cooking and baking. Pure white in color, the product has no raw or "beany" taste. The protein in Soyamel is a complete protein, containing all the essential amino acids in good proportions.

SiLite, Inc., has announced two new trays. Two models are available in the snack tray: one with a molded-in guard to hold a cup; the other a tumbler. The tray is made of Bakelite plastic and measures 8½ by 11 in. A new Glaslite tray is a low cost version of the company's older Glasteel fiber glass tray. The new tray does not have the molded-in steel ring featured in the more expensive tray; nevertheless, it is exceptionally strong as well as light in weight.

Crescent Metal Products, Inc, has three new models in its series 113 enclosed mobile aluminum bussing carts. Capacities range from six to nine standard 18 by 26 in. trays and twelve to eighteen 14 by 18 in. trays. Angle supports will also accommodate some standard size dish boxes. Inside tray support racks are easily removed by lifting up and out, facilitating cleaning. For a neat appearance in dining rooms, three sides have been enclosed,

History of The American Dietetic Association

1917-1959

Mary I. Barber, Editor

This is the first official history of the ADA from its inception in 1917 through 1959. More than being merely a record of the Association, its origin, structure, aims and accomplishments, this new book includes the many personalities that represent its leadership and explores the role of the dietitian from ancient times to the Space Age.

Chapter 1 considers the term "dietitian" historically, and presents a definition which describes the dietitian's responsibilities today. Chapter 2 outlines the history of dietetics from the ancient Ebers papyrus to the present, highlighting the achievements of great figures in the history of nutrition.

Chapter 3 gives an interesting account of the founding of the ADA. Chapters 4 through 7 record by decades the spectacular advances both of the ADA and of the science in general. Chapters 8 through 14 describe the structure of the Association, and the work of the various Committees and Sections devoted to education, community nutrition, diet therapy, etc.

Chapters 15 through 19 cover the history of dietitians in military and government service, the United States Children's Bureau and the role of the Journal of the ADA and the Association's Public Relations Department. Chapter 20 relates the challenging aspects of dietetics in the Space Age.

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as well as the top and bottom. Coran, durable, scuff-resistant plastic panels harmonize with any decor and are easily cleaned.

An aluminum hand-lift carrier with wire rack insert for conveying fresh or frozen pies and other baked goods, as well as plates of food, is also offered by *Crescent*. The wire rack inserts have been designed to stack and will accommodate 9- or 10-in. low fruit pies, depending on rack spacing. Models are available to hold five or eight pies. The carriers can be stacked horizontally or vertically without tipping when transported in delivery vehicles. The racks may also be used for storage. The carrier lid is secured with two quick snap catches. A large fold-down handle on the lid makes the unit easy to carry.

New publications recently released by *Processed Apples Institute, Inc.*, include "The Core of the Story," a twelve-page illustrated booklet in color which contains background information on the apple industry, a variety of new recipes, and a buying guide for apple products. "Dessert Delights" is an eight-page recipe booklet with sixteen dishes illustrated in color. "Entrées with Ease" presents in eight pages, fifteen recipes for entrées suitable for entertaining and family meals.

The *Hobart Manufacturing Company* has introduced a new instrument for measuring percentage of fat in ground beef. In 15 min., this unit will indicate percentage of fat from a 2-oz. specimen. Tests have shown it to be accurate within 1 per cent of laboratory chemical analysis. This portable unit operates unattended from any electrical outlet.

Durkee Famous Foods combines the stability of hydrogenated plastic shortening with the convenience of a liquid oil in a new liquid frying shortening, "Mel-Fry," made from pure vegetable oils plus preservatives and an added anti-foaming agent. With Mel-Fry, frying temperatures are reached more rapidly and operating costs are reduced because of its long life.

Westgate-California Products, Inc. recently introduced two new tuna products. One is "Breast O'Chicken Tuna" packed in 100 per cent corn oil. The new pack will be available in three types: solid white, solid light, and chunk light, and will be identified by a gold band at the top of the label. The second new product also carries a new brand name, "Best O Tuna." It is designed to provide a low-calorie, economical but tasty tuna to compete with imported brine-packed tuna. The Best O Tuna is packed in a clear vegetable broth (made of carrots, celery, onions, and seasonings). A special "Moisture Blend" process is used in packing the product. It will be available in solid light and chunk light styles. The Best O Tuna provides only half the calories of tuna packed in the usual oils.

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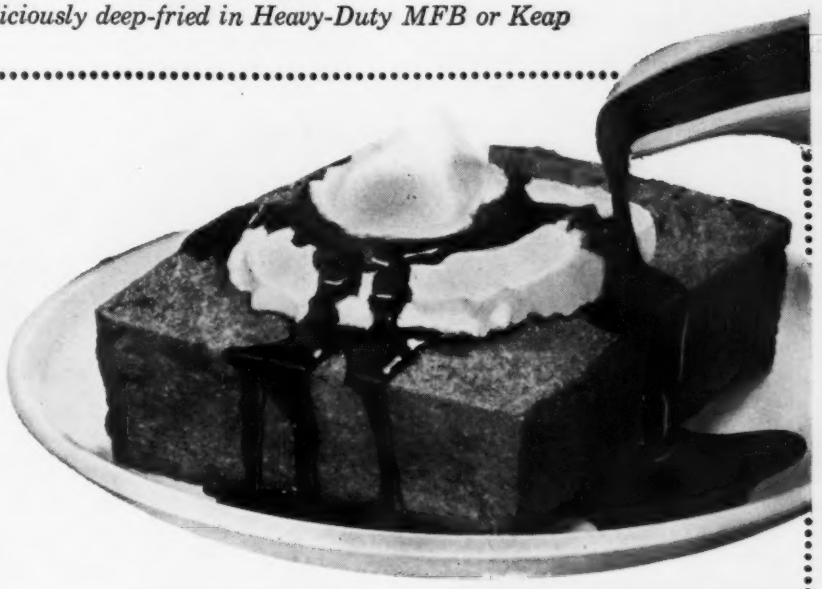
There's new customer-appeal in this profitable way to use bread, deliciously deep-fried in Heavy-Duty MFB or Keap



REGULAR FRENCH TOAST

Eggs, beaten	8
Milk	1 to 2 cups
Sugar	2 tablespoons
Salt	1 teaspoon
Vanilla	2 teaspoons
Flour (optional)	½ cup

Sprinkle with confectioners' sugar and serve with syrup, honey or strawberry preserves. Sour cream and cinnamon sugar. Berry or fruit sauces. Whipped cream dribbled with maple syrup.

FRENCH CHOCOLATE TOAST

Eggs, beaten	8
Chocolate milk or drink	1 to 2 cups
Salt	¼ teaspoon
Vanilla	1 teaspoon
Cinnamon	¼ teaspoon
Flour (optional)	½ cup

Serve with syrup or top with ice cream.
Knight's Delight Toast—Top with whipped cream and chocolate sauce as you serve it.

CHEESE-ONION FRENCH TOAST

Eggs, beaten	8
Milk	1 to 2 cups
Salt	1 teaspoon
Onion, grated*	1 tablespoon
Oregano or thyme, ground	1 teaspoon
Flour (optional)	½ cup

*Or ½ teaspoon onion powder.
Sprinkle cooked toast with grated Italian cheese. Serve with applesauce or with mixed green salad. May be prepared with French or Italian bread.

TOMATO-RAREBIT TOAST

Eggs, beaten	8
Hunt's Tomato Sauce	1 cup
Salt	½ teaspoon
Tarragon or basil leaves, crushed	1 teaspoon
Flour (optional)	½ cup

Top with cheese sauce. Deluxe version may include slice of ham or Canadian bacon on the toast.

ORANGE-GINGER FRENCH TOAST

Eggs, beaten	8
Milk	1 to 2 cups
Sugar	2 tablespoons
Salt	1 teaspoon
Orange peel, grated	2 tablespoons
Ginger, ground	1 teaspoon
Flour (optional)	½ cup

Use caraway rye bread or regular. Serve with syrup, orange marmalade or apple butter.

Note: Combine dip ingredients, beating smooth. Dip bread in batter. Deep fry French Toast in Heavy-Duty MFB or Keap heated to 375°. Dip formulas are for approximately 25 slices.

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Single copy 50¢

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Ten copies ---------- 3.75

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620 North Michigan Avenue
Chicago 11, Illinois

line of *Allen Foods, Inc.* The granules plus pulp are packed in 28-oz. vacuum cans. When dissolved in water, the contents make 2 gal. of beverage. Four oz. of the reconstituted drink provide 75 mg. ascorbic acid.

Hayden House Foods Company is now marketing turkey breast rolls for use in hot or cold club or open-face sandwiches, turkey dinners, or other specialties. The rolls hold together well for slicing by machine or hand and lend themselves to portion control operations with ease.

An all-in-one walk-in cooler-freezer and reach-in refrigerator has been introduced by *Elliott-Williams Co., Inc.* The new model will be available in unlimited size combinations from 6 ft. 10 in. by 6 ft. 10 in. to 60 by 60 ft., and in various heights to meet individual needs. It meets the new standards of the *National Sanitation Foundation*, a feature of which requires a curved radius of ½ in. or greater on all interior corners, walk-in door sill at the same height as inside bottom, and aluminum alloy or stainless steel interior finish. Standard sections are offered for easy, inexpensive future changes.

Starting with a basic 6 ft. 10 in. square, a new 35°F., reach-in, walk-in cooler manufactured by *Elliott-Williams Co., Inc.*, is expandable for future needs. Sectional construction with standard "N-Large-It" units provide change at minimum cost. For extra convenience, walk-in doors and reach-in windows may be located in any section. The new model, called Model 107-C, has been approved by the National Sanitation Foundation. A choice of aluminum, stainless steel, and other metals is available for interior and exterior.

A fourteen-page booklet from *Golden Dipt Manufacturing Co.*, pictures and describes its line of mixes for breading and batter, meat loaf, and stuffing. Low percentage of coating fall-off during cooking is claimed. Quantity recipes are available for meat loaf, salmon patties, Maryland fried chicken. Spanish pork chops, and French fried onion rings.

Kaiser Aluminum and Chemical Sales, Inc., has announced a three-compartment, aluminum foil serving tray designed for institutional feeding. Fabricated from 0.0035-in. gauge foil, it has a capacity of 26.1 cu. in. It measures 8 by 5¾ and is 1 in. deep. A curled rim provides maximum rigidity. The heat conductivity and retention of the foil keeps food warm.

A newly designed contemporary chair from *National Store Fixture Co., Inc.*, has classic lines to fit well with either modern or traditional decor. The simple, flared back and upholstered seat have self-welt seams for added quality. The seasoned hardwood frames have chuck-doweled and glued joints, reinforced with corner braces for extra rigidity. Choice of wood finishes in dark walnut, tawny walnut, ebony, and harvest wheat are offered.

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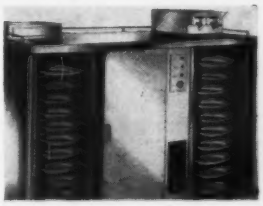

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INDEX TO VOLUME 39

The following abbreviations indicate the source of material indexed: "ab," abstract under Current Literature; "br," Book Reviews; "cc," Current Comment; "ed," Editorial; "f," filler; "l," Letters to the Editor; and "nn," News Notes. An asterisk indicates an original article in this JOURNAL. Book Reviews appear in the subject index under the heading, "Book Reviews." The Author Index, which follows the Subject Index, includes only the names of authors of original material appearing in this JOURNAL in full or abstracted in the editorial section or in fillers, and the authors and reviewers of books reviewed.

A

Absenteeism, formula for computing, ab 380
Absorption
  of beta carotene and vitamin A, ab 358
  intestinal, ab 368
    derangements of, *449
    of protein, fat, and carbohydrate, ab 490
    of riboflavin, ab 236
Acceptability of repetitive diets, ab 47
Accounting
  calculator for figuring mark-ups, nn 288
  controlled, plan for, ab 384
Accreditation, dietary standards for, ab 148
Acid balance of body, ab 608
Additives, food, *103
  booklet on, nn 62
  control in the Netherlands, FAO report, nn 394
  FAO statement on, ab 370
  functions of and regulation, ab 490
  and nutritive value of U.S. food, *118
Administration
  management development program, *336
  work sampling to set time standards, *327
Adolescence
  eating problems in, ab 51
  iron nutrition of girls, f 601
  nutrition education during, ab 516
Aged
  body fat in, ab 496
  with diabetes, oral hypoglycemic therapy for, ab 135
  feeding of, ab 47, ab 516
    problems of, *444
  meals-on-wheels programs for, ab 236
  nutritional supplementation for, ab 135
  women
    blood constituents of, report, nn 624
    food intake and energy expenditure of, ab 609
Alcoholism, neurologic diseases in, ab 358
Algae as human food, ab 608
Allergy
  cause of eosinophilic granuloma, ab 45
  food, ab 362
  to raw cow's milk, ab 609
Almonds, consumer preferences for, ab 364
Alpha-tocopherol (see vitamin E)
American Dietetic Assn., The
  Beeuwkes, A. M., President, ed 481
  Blaker, G., becomes M. S. Rose Fellow, ed 600
  Eating Is Fun . . . for Older People, Too! revised, nn 308
  films, nn 408
  Loan Fund, ed 485
  McCann, M., receives L. J. Roberts Essay Award, ed 601
  Mead Johnson Awards
    1961 recipients, ed 600
    rules governing, ed 484
  Mitchell, E. L., Memorial Scholarship established, ed 485
  Northrop, M. W., receives Copher Award, ed 598
  officers for 1961-62, nn 60
  President's report, *441
  Roberts, L. J., Essay Award—McCann, M. B., 1961 recipient, ed 601
  Rose, M. S., Fellowship
    Baker, G., 1961 recipient, ed 600
    rules governing, ed 383
  third seminar, nn 408
  Williams, R. R., made honorary member, ed 599
American Medical Assn. fights quackery, f 568
Amino acids
  in beef, ab 608
  of calcified protein, ab 610
  and corn gluten, ab 238
  effect of imbalance, ab 238
  in Guatemalan beans, ab 608
  supplementation, pros and cons, ab 605
Anemia
  of pregnancy, copotein-ferrous in, ab 358
  prevalence of, ab 46
  tapeworm, and serum vitamin B_{12} levels, ab 606
Angola, malnutrition in, *585
Anorexia, ab 237
  metabolism in, ab 46
Anoxia, blood changes in, ab 240
Anthropology—diet and food beliefs of Peruvian Shipibos, *126
Antibiotics in milk, ab 238
Appetite suppressants in reducing
  effect of, ab 606
  value combined with tranquilizer, ab 358
Apples, storage of, ab 372
Architect and food service consultant, ab 144
Armed Forces, food preferences of, nn 66
Ascorbic acid
  inhibition of synthesis, ab 358
  in potato, ab 608
  to prevent potato darkening, ab 607
  in protein utilization, *476
  reduced intake explained, nn 396
  retention in electronically cooked vegetables, *321
  in white cells of Navajos, ab 496
Asparagus spears, frozen vs. canned, *473
Atherosclerosis
  and dietary cholesterol, ab 137, ab 494
  and serum cholesterol ab 236, ab 610
Athletes
  food intake of, *225
  pregame liquid meal for, ab 608
Avocadoes, ab 256

B

Bacteria in poultry, ab 236
Bajra (grain) diet, children's metabolism on, ab 360
Basal metabolic rate and protein-bound iodine in women of Assam, India, ab 360
Beans
  green, microorganisms in freezing, ab 362
  Guatemalan, amino acids in, ab 608
  navy, as supplement to corn, ab 610
Bed-making, energy expended in, *205
Beef
  amino acids in, ab 608
  enzyme activity during storage, ab 49
  ground
    fat content, yield, and palatability of lower grades, *317
    objective test for quality, ab 47
  irradiated, odors from, ab 238
  roasts, effect of bone on fallout in, *567
  stew, frozen concentrated, ab 614
  tenderized with chelating agent, ab 47
  water retention of, ab 366
Beeuwkes, A. M., becomes A.D.A. President, ed 481
Beriberi
  in infants, ab 240
  thiamine metabolism in, ab 607
Better Business Bureaus fight food faddism, *210
Bifidus factor and heat-induced lactulose, ab 496
Bioflavonoids in treating common cold, ab 136
Blaker, G., becomes M. S. Rose Fellow, ed 600
Blood
  fatty acids of, ab 49
  findings in pregnant women in India, *130
  loss, carbohydrate metabolism in, ab 240
  pressure
    and dumping syndrome, ab 53
    and electrolyte excretion, ab 136
    sodium and potassium restriction to lower, ab 136
Body composition and caloric restriction, ab 366
Body density and fat-free weight, ab 234
Body weight and caloric intake, ab 138
Bone, effect on fallout in beef roasts, *567
Bones
  osteoporosis and calcium intake, ab 496
  skeletal maturation, calcium intake, and illness, ab 606
Book Reviews
  Betty Crocker's Outdoor Cookbook, 356
  Cholesterol Control Cookery, 233
  Diabetic Care in Pictures, 356
  Diet and Menu Guide, 356
  Dietary Proteins in Health and Disease, 233
  Folk Medicine, *120
  Food Chemistry, 233
  Food Service in Industry and Institutions, 233
  Fundamentals of Nutrition, 233
  Golden Age Cookbook, The, 233
  Health Hucksters, The, 233
  Health Organizations of the United States and Canada: National, State and Regional, 233
  Merck Manual of Diagnosis and Therapy, The, 356
  365 Ways to Cook Hamburger, 233
  Vegetarian Cookery, 233
Botulism, irradiation to kill spores, ab 364
Bread
  flavor made with maltol, ab 236
  supplemented with lysine, ab 140
Breading vs. bread crumbs, ab 370, ab 612
Breast feeding, current practices, ab 361
Breathing, oxygen cost in obesity, ab 370
Budget, dietary, ab 250
Burns in children, management and therapy, ab 133, ab 500

C

Cadmium poisoning, ab 244
Cake quality with electronic cookery, ab 49
Calcium
  intake and skeletal maturation, ab 606
  interpreting metabolic data on, *209
  metabolism, ab 48
    disorders of, ab 51
    on high-cereal diet, ab 610
  and osteoporosis, ab 496
  in radioactive contaminated food, *561, *567
  retention on low intake, *220
  supplement, effect on liver, ab 133
  utilization from different sources, ab 360
Calculation of protein values from food tables, ab 500
Calories
  balance
    and adipose tissue metabolism, ab 52
    and central nervous regulation, ab 52
    and endocrine system, ab 52
    and fat tissue metabolism, ab 52
    and physiologic factors, ab 52
  energy balance in infants, ab 52
  intake
    of "big eaters," nn 66
    and body weight, ab 138
    and energy expenditures, ab 52
    and metabolism, ab 46
  lost through household food discards, *578
  requirements
    with caloric restriction, ab 366
    in pregnancy, ab 52
    related to height and weight, ab 235
Canada
  cirrhosis in, ab 491
  phenylketonuria in, ab 134
  Pine House Nutrition Project, ab 491
Cancer
  hazards from canned foods, ab 491
  plasma protein abnormalities in, ab 240
  uric acid excretion in, ab 240
Canned foods
  asparagus spears vs. frozen, *473
  cancer hazards of, ab 491
  changes during storage, ab 494
  nutritive value of, *105
  oldest in world, ab 362
Carbohydrate
  in citrus peel, ab 49
  diets and cholesteremia, ab 135
  intestinal absorption of, ab 490
  metabolism
    in blood loss, ab 240
    inborn errors of, ab 360
    regional, ab 360
Career guidance, census of health workers, f 121
Caries, dental, fluorine tablets to prevent, ab 237
Carotene absorption and vitamin A, ab 358
Carotenoids in navel oranges, ab 366
Carrageenin, effect on peptic digestion, ab 135
Cathcart, E. P., biographical note, f 392
Cavendish, H., biographical note, f 264
Cellulose, crystalline, ab 510

Central nervous regulation and caloric balance, ab 52
Cereals, dry, stabilized raisins for, ab 134
Cereal diet, calcium and phosphorus in, ab 610
Cerebral hyponatremia, sodium metabolism in, ab 609
Cerebral palsy, feeding patient with, ec 43
Cesium in milk, ab 140, ab 246, *561
Change makers, automatic, ab 506
Cheese, ab 370
  Cheddar, grading of, nn 522
  cholesterol in, ab 607
  Swiss, adulterated, seized, f 128
  types and uses, ab 144
Chelating agent to tenderize beef, ab 47
Chest disease, chronic, diet in, ab 51
Children
  burn therapy for, ab 133, ab 500
  diabetic
    diet for, ab 607
    sorbitol in diet, ab 134
  dietary intake of, ab 490
  effect of rice replacement by pearl millet, ab 606
  with galactosemia, development of, ab 240
  lysine and methionine requirements of, ab 500
  malnutrition in, ab 136
  metabolic studies in India, ab 361
  nutrition of, ab 136
  obesity in, ab 491
  pantothenic and folic acids in, ab 496
  Pine House Nutrition Project in Canada, ab 491
  protein intake from animal sources, ab 606
  ulcers in, ab 234
  undernourished, serum lipids in, ab 607
  underweight, use of phenpropionate with, ab 45
Cholesterol
  blood, and carbohydrate diets, ab 135
  in cheese, ab 607
  dietary, and atherosclerosis, ab 137, ab 362, ab 494
  liver, effect of different fats on, ab 140
  plasma, oils and, ab 50
  review of recent literature, nn 82
  serum
    and atherosclerosis, ab 236, ab 610
    in chicks, ab 238
    on corn oil diet, ab 368
    and diet, ab 235
      and physical findings, ab 132
    effect of peanut oil and ghee on, ab 133
    effect of sesame and coconut oil on, ab 133
    and fatty acid chain length, ab 500
    and fiber and pectin intake, ab 53
    in infants, ab 605
    relation of protein and polyunsaturated fatty acid intake on, ab 500
    and serum magnesium, ab 132
Chronic illness, 10 challenges of, *193
Chylomicrons, serum, in hyperlipemia, ab 494
Cinnamon fact sheet published, nn 418
Cirrhosis in Canada, ab 491
Citrus crystals developed, ab 612
Citrus peel, carbohydrates of, ab 49
Coconut oil, effect on plasma cholesterol, ab 133
Coffee
  brewing rules, ab 53
  deleterious effects of, ab 366
Cold, common, bioflavonoids in treating, ab 136
Colic in infants, ab 237
Columbia Univ., new nutrition chair at, nn 60
Communications
  achieving effective, ab 504
  booklet on, nn 62
  listening in dietetics, *26
Congress on Medical Quackery, nn 394, nn 620
Consultant
  and architect, roles of, ab 144
  design, function in planning layouts, ab 55
  dietary, functions of, ab 614
Contract food service in college, ab 142
Convenience foods, *101
Cook books, historical, ab 506
Cooking
  palatability of pork loin after, ab 494
  pressure, effect on nutrients, ab 364
  with wine, ab 370
Copher, M. H., Award goes to M. W. Northrop, ed 598
Copotein-ferrous in anemia of pregnancy, ab 358
Corn, navy beans as supplement for, ab 610
Corn oil diet, ab 368
Cortisol as stimulant for gylcogen, ab 360
Cost
  food
    control of, ab 374
    in hospitals, f 230
    related to income in U.S., f 332
  labor, control of, ab 506
Cottage cheese whey dried by foam spraying, ab 510
Cows, synthesis of fat in milk, ab 238
Crawford, A., biographical note on, f 584
Cream
  as food poisoning vehicle, ab 366
  sour
    defined, ab 510
    low-calorie, f 131
Creativity, developing, ab 378
Cultural aspects of food, ab 510, ab 512
Custard, frozen, formulas for, ab 607
Cystic fibrosis, dietary treatment of, ab 491

D

Danish pastry, frozen storage of, ab 236
Decision-making, ab 252
Deep-frying
  equipment, ab 55
  specialities, ab 55
Deficiencies
  kwashiorkor, ab 491
    and marasmus, ab 366, ab 366
  pancreatic, in cystic fibrosis, ab 491
  thiamine, and central nervous system, ab 358
Dehydrated foods, ab 248
  cottage cheese whey foam-dried, ab 510
  nutritive value of, *105
  quick cook, ab 612
  vegetables, new types, nn 66
Dehydrofreezing, ab 53, ab 54, *102, *105, ab 374, ab 374—See also Freeze-drying
Dental caries
  cariogenicity of foods, ab 364
  effect of chemical agents on, ab 364
  and fluoridation, ab 138, ab 237
  incidence, ab 364
Detergent concentration in dish machines, test for, *229
Diabetes
  in aged, oral hypoglycemic therapy for, ab 135
  cardiovascular complications in, ab 235
  glucagon problem in, ab 51
  and heart disease in Africans and Indians, ab 500
  hyperthyroidism, in ketosis, ab 45
  insurance for patients with, ab 491
  juvenile
    diet therapy for, ab 607
    and safflower oil, ab 244
    sorbitol in diet, ab 134
  lipoprotein patterns in, ab 607
  neuropathy, ab 140
  phenformin in, ab 491
  proteinuria in, ab 134
  surgery in, hazards of, ab 500
  tolbutamide hypoglycemia, ab 138
Diet and urinary stones, ab 238
Diet manual done in card form, ab 254
Diet therapy
  corn oil diet, ab 368
  in cystic fibrosis, ab 491
  for diabetic children, ab 607
  dietetic ice cream, ab 237
  fat, high unsaturated, for home use, ab 50
  after gastric resection, ab 47
  for hypercholesteremia, ab 362
  in peptic ulcer, ab 368
  reducing diets, ab 46
    formula diets, f 232
      A.M.A.'s stand on, f 34
  ulcer diets, what they are, f 200
Dietary department, staffing of, *32
Dietary surveys, two methods compared, *569
Dietetic foods, ab 237
Dietetics
  continuing professional growth, *15
  internship in, *18
  in Sweden, ab 51
  a toast to, f 337
Dietitian
  definition of, ab 246
  shortage in England, ab 235
Digestion, peptic, effect of carrageenin on, ab 135
Digitalis and sugar transport, ab 45
Dining service stations, ab 616
Discards, food
  method for measuring household, *578
  in U.S., f 25
Dishes, plastic vs. vitreous compared, ec 231
Dishroom renovation, ab 142
Dishwashing, ab 254
  detergent concentration test, *299
  done by women, ab 252
  new automatic cold water machines for glasses, *230
  planning for, ab 372
  talc test for surface cleanliness, *228
  time-and-motion studies of, ab 142
Display cases for food, ab 384
Diuretics and sodium retention, ab 133
Dumping syndrome
  and blood pressure, ab 53
  management of, ab 136

E

Economics, food, in U.S., f 332
Education
  dietetic internship, *18
  of nurses, diet therapy and nutrition tests for, *35
  for quality food service, *22
Efficiency
  increasing, ab 506
  work sampling to set time standards, *327
Eggs
  grading of, nn 66
  preparation of, ab 248
  purchasing, ab 146
Electrolyte excretion and hypotensive response, ab 136
Electronic cooking
  cable quality in, ab 49
  equipment, ab 618
  of vegetables, ascorbic acid retention and palatability, *321
Emotional factor in interpreting metabolic data, *209
Employees, rating technique for, ab 614
Employment
  personal history data in hiring, value of, *333
  working years of U.S. population, f 320
Endocrine system and caloric balance, ab 52
Energy
  balance in infants, ab 52
  expenditure
    and caloric intake, ab 52
    in elderly women, ab 609
    in walking, ab 609
  needed for homemaking tasks, *205
  -saving kitchens, *201
England
  changing food habits in, ab 52
  dietitian shortage in, ab 235
  1958 food supply, reported, nn 268
  nipples used in bottle-feeding infants, nn 235
  strontium in diet, ab 237
Enrichment, 20th anniversary of, ab 55
Enzymes
  activity in beef during storage, ab 49
  in food processing, ab 612
Eosinophilic granuloma due to allergy, ab 45
Equipment
  change makers, ab 506
  convertible counter, ab 250
  for deep-frying, ab 55
  designing refrigerated areas, ab 616
  electric fry kettles, ab 612
  electronic, ab 618
  fabricated, ab 512
  food display cases, ab 384
  infrared heating, ab 250
  maintenance records, ab 506
  mobile, ab 258
  needs of future, ab 376
  new on market, ab 614
  of plastic laminate, ab 516
  purchasing of, ab 144
  refrigerators, ab 514
  specifications for, ab 146
Escoffier, the chef, ab 256
Estrogens in Wilson's disease, ab 48
Executive development, ab 55, *336
Exercise
  and lipemia, ab 49
  and low serum potassium, ab 47

F

Factory workers, Italian-American, serum cholesterol, diet, and physical findings in, ab 132
Faddism, food, *120, ab 246
  AMA fights, f 568
  Better Business Bureaus fight, *122
  Congress on Medical Quackery, nn 620
  Federal Trade Commission fights, f 604
  Food and Drug Administration program against, ab 54, ab 54, f 566
Fallout contamination
  of food, *561, *567
  of wheat, ab 502
Fat
  body
    determining, ab 237
    estimating, ab 246
    metabolism of, ab 138, ab 140
    in older persons, ab 496
    in young women, ab 240

depot, regulated by linoleic acid, ab 50
fecal, determination of, ab 234, ab 234
intake
effect on serum chylomicrons in hyperlipemia, ab 494
and excretion, ab 50
intestinal absorption of, ab 490
in lower grades of ground beef, *317
metabolism
and caloric balance, ab 52
disorders of, ab 51
synthesis by cows, ab 238
Fats
data on cooking, ab 612
effect of different on liver cholesterol, ab 140
heat, changes occurring with, ab 134, f 204
influence in hyperthyroid rats, ab 45
saturated, ab 137
unsaturated, diet high in, ab 50
Fatty acids
effect of chain length on serum cholesterol, ab 500
in 11 brands of margarine, *313
essential, effect of, ab 368
of heart and blood, ab 49
in olive oil, ab 137
and plasma cholesterol, ab 50
polyunsaturated, and protein intake, effect on serum cholesterol, ab 500
in spinach, ab 364
unsaturated, home diet high in, ab 50
Federal Trade Commission fights quackery, f 604
Fiber intake and serum cholesterol, ab 53
Films, book on planning, nn 154
Finished Foods Committee of AHEA, ab 49
Fish
bottom, sodium and potassium in, ab 608
consumption in Canada, ab 248
flour, minerals in, ab 610
frozen, changes in storage, ab 494
frying, ab 616
protein, denaturation of, ab 238
sauces, ab 616
Flavor and food acceptance, ab 52
Fluoridation of water
and dental caries, ab 138
and dermatitis, ab 237
poison, effects of, ab 608
Fluoride
metabolism of, ab 364
tablets to prevent caries, ab 237
uptake by teeth, ab 608
Folic acid in pre-adolescents, ab 496
Food, images of, to various people, ab 510, ab 513
Food and Agriculture Organization publications
European Seminar on Evaluation of Home Economics Extension Programs, nn 66
Evaluation of the Carcinogenic Hazards of Food Additives, nn 394
[illegible] the Great Potential Food Supply, [illegible] 394
Food Additive Control in the Netherlands, nn 394
Report of the FAO/WHO Seminar on Problems of Food and Nutrition in Africa South of the Sahara, nn 62
Report of the Symposium on Education and Training in Nutrition in Europe, nn 62
Report of the Technical Meeting on Nutrition in Food Policy and Planning in Asia and the Far East, ab 370
statement on additives, ab 370
Food composition, ab 51
figures from commercial companies, nn 154
of milk, ab 238
predicting protein values from food tables, ab 500
vitamins in fortified potato flakes, ab 236
Food and Drug Administration program against food faddism, ab 54, ab 54, f 566, nn 620
Food habits
in Angola, *585
of athletes, *225
changing in England, ab 52
Jewish, ab 516
definitions, f 594
reasons for dietary laws, ab 136
of London busmen, ab 52
of migrants, ab 53
in pregnancy
in England, ab 52
in Hawaii, *569
in Singapore, ab 364
Food intake
of children, ab 490
and discards, method of measuring household, *578
and glucagon, ab 140
related to height and weight of pregnant women, ab 235
Food misinformation (see Faddism, food)
Food and Nutrition Board, ab 51
Science and Food: Today and Tomorrow, published, nn 268
Food poisoning, ab 612
from contaminated well water, ab 502
control program in U.S., ab 244
S. aureus in cream, ab 366
Salmonella infantis from ham, ab 610
from shellfish, ab 372
Food preferences
of Armed Forces, nn 66
for salad dressing, f 355
of smokers, ab 48
of South Dakota college students, *595
Food restriction and vitamin B_{12}, ab 137
Food service
college
centralized, ab 142
requirements, ab 55
contract, ab 252
hospital, staffing for, *32
in nursing homes, f 21
Food service supervisors' course at Michigan State, ab 252
Fork, history of, ab 372
Formula diets, f 232, ab 240
A.M.A.'s position on, f 34
and weight control, ab 135, ab 135
Formulas for infants, ab 45
Freeze-drying, ab 53, ab 54, *102, *105, ab 374, ab 374, ab 612
in Europe, ab 250
via microwaves, ab 510
nutritive value after, *105
Frozen foods
advances in technology, ab 494
asparagus spears vs. canned, *473
baby foods, ab 256
beef stew, ab 614
custard, formulas for, ab 607
Danish pastry, storage of, ab 236
defrosting turkey, ab 616
dinners, popularity of, ab 374
economics of industry, ab 54
fish, changes in storage, ab 494
green beans, microorganisms in, ab 362
handling of, ab 54, ab 374
in hospital food service, ab 614
Italian, ab 256
"liquefrozen" meals, ab 614
microbiology of, ab 146, ab 362, ab 374
peas, ab 616
pizza, ab 256
salad dressing made with safflower oil, ab 134, nn 398
sauces for home use, *590
turkeys, defrosting of, ab 376
vegetables, quality of, ab 362
in volume feeding, ab 374
Fruit
canned, changes during storage, ab 494
fresh
chart on net weights in containers, nn 286
purchasing chart on, nn 286
serving, ab 610

G

Galactosemia, development of children with, ab 240
Garnishing, guide for, ab 510
Gastric resection, diet after, ab 47
Gastrointestinal disease, nutritional aspects of, ab 132
Genetics, influence on teeth, ab 364
Ghee, effect on plasma cholesterol, ab 133
Ginger, f 480
Glass for food warming, ab 148
Glasses, new automatic cold water washers for, *230
Glassware, guide to care published, nn 82
Glossary of French culinary terms, nn 538
Glucagon
and food intake, ab 140
problem in diabetes, ab 51
Glucose, effect on insulin in non-diabetics, ab 360
Gluten, corn, and amino acids, ab 238
Glycogen, cortisol-stimulation of, ab 360
Glycogenolysis in blood loss shock and anoxia, ab 240
Government publications
Basic Facts on the Health and Economic Status of Older Americans, nn 520
Cheese Buying Guide for Consumers, nn 266
Consumption Trends and Patterns for Vegetables, nn 622
Costs, Net Margins, and Selling Prices of Beverages Sold in Employee Food Service, nn 62
Family Food Stockpile for Survival, nn 520
Food Is a Bargain, nn 394
Food Stockpiling for Emergency Shelters, nn 266
Food We Eat, The, nn 394
Heart Research News, nn 266
Measures and Procedures for Analysis of U.S. Food Consumption, nn 622
Nursing Home Standards Guide, nn 66
Performance Capacity, nn 154
Phenylketonuria, nn 624
Planning Your Family Food Supply, nn 394
Quantity Recipes Using Dried Whole Egg Solids, nn 62
Read the Label, nn 624
Trends and Patterns in U.S. Food Consumption, nn 622
Vitamin B_{12} nn 520
White House Conference on Aging, report, nn 62
Grading
of Cheddar cheese, nn 522
of eggs, nn 66
palatability, fat content, and yield of lower grades of ground beef, *317
Grease trap, solving problem of, ab 148
Growth of children on whole wheat substitute, ab 235
Guatemalan beans, amino acids in, ab 608

H

Ham
Salmonella infantis in, ab 610
standards revised, nn 522
Handicapped, work simplification for, ab 618
Health, selling to the public, problems in, f 326
Heart, fatty acids of, ab 49
Heart disease
and alimentary lipemia, ab 50
body sodium in, ab 606
and diabetes in Africans and Indians, ab 500
in idiopathic hypercalcemia, ab 137
serum lipids in, ab 490
Heat
effect on cooking fats, ab 134, f 204
treatment removes allergen in milk, ab 609
Height
of adults in U.S., ab 244
and food intake, ab 235
Hemoglobin in sick infants, ab 46
Heparin potassium, as lipemia-clearing agent, ab 132
Hepatitis
effect of yeast diet on, ab 368
waterborne epidemic, ab 610.
Hiring, value of personal histories in, *333
History of nutrition
beliefs and food practices in pregnancy, *455
Cathcart, E. P., biographical note, f 393
Cavendish, H., biographical note, f 264
cookbooks in, ab 506
Crawford, A., biographical note, f 584
ice cream cone, invention of, f 316
iced tea, invention of, f 316
McLester, J. S., biographical note, f 125
olive oil, f 37
Rutherford, D., biographical note, f 31
Smith, E., biographical note, f 475
St. Louis, city of food firsts, f 316
Home care programs, nutrition in, *198
Home economics, maroon official academic color for, nn 152
Homemaking, energy expended in, *205
Hospital food service
food costs in, f 230
frozen foods in, ab 614
half-trays for, ab 612
patients become cooks, ab 514
Hyperbilirubinemia and vitamin K, ab 490
Hydrogen peroxide-treated milk, ab 238
Hypercalcemia, treatment with sodium sulphate, ab 244
Hypercholesteremia
dietary treatment of, ab 362
niacin treatment in, ab 50, ab 490, ab 496
Hyperlipemia, serum chylomicron fatty acids in, ab 494
Hypertension
absence on two Pacific islands, ab 609
sodium and potassium in, ab 360
Hyperthyroidism
in diabetic ketosis, ab 45
influence of fats in, ab 45

I

Ice cream, ab 258
cone, invention of, f 316
dietetic, ab 237

economical desserts, ab 55
popularity of, nn 158
Idiopathic hypercalcemia, cardiac changes in, ab 137
Illness, effect on skeletal maturation, ab 606
Income, related to food costs in U.S., f 332
India
children, metabolism studies on, ab 361
diabetes and heart disease of migrants to South Africa, ab 500
jowar cereal as rice substitute, nutritive value of, ab 133
serum protein levels in, ab 136
women of Assam, protein-bound iodine and basal metabolic rate in, ab 360
Individuality factor in interpreting metabolic data, *209
Industrial engineering aids dietary department, *22
Infants
beriberi in, ab 240
birth weight in India, *130
breast-feeding of, ab 360
colic in, ab 237
energy balance in, ab 52
formulas for, ab 45
frozen foods for, ab 256
hemoglobin in sick, ab 46
nipples for bottles used in England, ab 235
nitrogen and mineral retention in, ab 46
nutrition in India, *129
serum cholesterol in, ab 605
underweight, use of phenpropionate with, ab 45
Infrared heating in restaurants, ab 250
Injury, metabolic changes after, ab 368
Inspection of perishables, ab 146
Insulin in non-diabetics after glucose, ab 360
Insurance for diabetic persons, ab 491
Interns, dietetic, projects to improve food quality, *22
Internship for executives, ab 254
Inventory records, list for, ab 376, ab —
Iran, nutrition survey in, ab 358
Iron
absorption, ab 238
availability in rice polishings, ab 133
in kwashiorkor, ab 609, ab 609
nutrition of young women, f 601
utilization with different sources of calcium, ab 360
Irradiation
of beef, odors after, ab 238
destroys vitamin E, ab 49
effect on lettuce, ab 364
for food preservation, ab 374
to kill botulism spores, ab 364
of meat to prevent trichinosis, ab 236
nutritive value of foods after, *105
preservation of milk, ab 134

J

Jewish foods, ab 516
definitions, f 594
dietary laws, reasons for, ab 136
Job evaluation, ab 616
Jowar as rice substitute, nutritive effect of, ab 133

K

Kettles, electric fry, ab 612
Kidney disease
albumin infusions and serum lipoproteins in, ab 48
protein excretion in, ab 500
urolithiasis, renal clearance in, ab 132
Kitchen planning
errors in, ab 618
to save energy, *201
Koehne, M., obituary, 338
Kwashiorkor, ab 366, ab 366, ab 491
in Cape Town, South Africa, ab 50
iron in, ab 609, ab 609
lysine supplementation in, ab 606
serum protein in, ab 609

L

Labor costs
control of, ab 506
cutting, ab 510
Labor relations—see Personnel administration
Labor-saving techniques, ab 146
Lactulose, head-induced, and bifidus factor, ab 496
Laundry rental for restaurant, ab 144
Layout
for dish pantry, ab 142
energy-saving kitchens, *201
factory-type for food service, ab 142
function of design consultant in planning, ab 55
kitchen, ab 382
Leadership, dimensions of, ab 614
Lettuce, effect of radiation on, ab 364
Lighting preferences of restaurant customers, ab 142
Linoleic acid
metabolic effects of, ab 366
as regulator of depot fat, ab 50
Lipemia
-clearing with heparin potassium, ab 132
and exercise, ab 49
and heart disease, ab 50
Lipids, serum
and dietary fat, ab 244
effect of diet on, ab 237
in heart disease, ab 490
in undernourished children, ab 607
Lipoproteins
in diabetes, ab 607
in nephrosis, ab 48
and triglyceride concentration, ab 48
in women, ab 136
"Liquefrozen" meals, ab 614
Listening in dietetics, *26
Liver
disease, in Canada, ab 491
effect of calcium supplement on, ab 133
Longevity and nutrition, ab 137
Lysine
requirement of children, ab 500
supplement in bread, ab 140
supplementation in Kwashiorkor, ab 606

M

Macroglobulinemia, case report, ab 368
Magnesium
requirements for women, ab 137
serum, related to serum cholesterol, ab 132
Maintenance records for equipment, ab 502
Maize—see Corn
Malabsorption syndrome, diagnostic tests for, *449
Malnutrition, ab 138, *444
in Angola, *585
challenge of world, ab 144
kwashiorkor and marasmus, ab 366, ab 366
protein, ab 246
Maltol, flavor of bread made with, ab 236
Management development, *336
Mango, strained, nutritive value in rice-milk diet, ab 133
Marasmus, ab 366, ab 366
Margarine, fatty acids in 11 brands, *313
Maroon, official home economics academic color, nn 152
McCann, M., wins L. J. Roberts Essay Award, ed 601
McLester, J. S., biographical note, f 125
Mead Johnson Awards to A.D.A.
1961 recipients, ed 600
rules governing, ed 484
Meals-on-wheels programs, ab 135, ab 236
Meat
effect of bone on fallout in roasted, *567
imported to be marked, nn 522
irradiation to prevent trichinosis, ab 236
precooked, storing, nn 66
processed, vacuum packing of, ab 47
trichinae in, ab 137
Melons, purchasing, ab 382
Menu-making, ab 512
in nursing homes, ab 256
to please patients, ab 378
Menus, cycle
filing, cc 352
pros and cons, cc 339
Metabolism and caloric intake, ab 46
Methionine requirement of children, ab 500
Methods improvement, ab 376
Mexicans, gastrointestinal disease in, and nutrition, ab 132
Microbiology
bacteria in poultry, ab 236
controlling bacterial growth, ab 144
of frozen foods, ab 146, ab 374
bacterial standards, ab 54
contamination in freezing
beans, green, ab 362
corn, ab 362
peas, ab 362
sea food, ab 54
Micro-encapsulation of foods, ab 53
Microwave cooking—See Electronic cooking
Microwaves in freeze-drying, ab 510
Migrants, eating habits of, ab 53
Milk
allergy to raw cow's, ab 609
antibiotics in, ab 238
composition of, and environment, ab 238
hydrogen peroxide-treated, ab 238
nutritive value needs understanding, nn 308
radiation preservation of, ab 134
radionuclides in, ab 502
strontium and cesium in, ab 140, ab 246, *561
strontium in, removal method, nn 522
Milk shakes in school lunch program, f 219
Millett as rice replacement in vegetarian diet, ab 606
Minerals
metabolism with wheat substitute, ab 235
overnutrition with, ab 605
retention in infants, ab 46
Mislabeled foods seized, f 208
Mitchell, E. L., Memorial Scholarship, regulations governing, ed 485
Mixes, instant, for pies, summer storage of, ab 254
Multiple sclerosis, tolbutamide in, ab 47
Mustard, ab 372

N

Navajos, white cell ascorbic acid in, ab 495
Navy, U.S.
food and equipment for, ab 362
food research for, ab 500
Negroes, diabetes and heart disease in South Africa, ab 500
Neoplastic disease, nitrogen balance and, ab 358
Nephrosis, albumin infusions and serum lipoproteins in, ab 48
Nervous system, central, and thiamine deficiency, ab 358
Neurologic diseases
and alcoholism, ab 358
diabetic neuropathy, ab 140
Newspapers, nutrition education via, *124
Niacin, effect in hypercholesteremia, ab 490, ab 496
Nigeria dietary study in, *467
Nitrogen
balance
interpreting metabolic data on, *209
and neoplastic disease, ab 358
retention in infants, ab 46
Northrop, M. W., receives Copher Award, ed 598
Nursing, diet therapy and nutrition tests in, *35
Nursing education
diet therapy and nutrition tests in, *35
guidelines for teaching nutrition and diet therapy, cc 38
instructor has field observation in public health nutrition, cc 41
Nursing homes
feeding problems in, cc 43
food manual for, nn 394
food service in State of Washington, f 21
menu planning in, ab 256
purchasing food for, ab 256
Nutrition, common errors of, ab 234
Nutrition education
of adolescents, ab 516
cart used in hospital for, ab 376
for hospital personnel, ab 55
through newspapers, *124
Nutrition Foundation expands, nn 60
Nutrition survey in Iran, ab 358

O

Obesity
appetite-suppressants, use in, ab 358, ab 606
booklet on reducing diets, nn 172
causes of, ab 605
childhood, ab 491
formula diets for reducing, ab 135, ab 135, ab 240, f 232
A.M.A.'s position on, f 34
metabolism in, ab 46
oxygen cost of breathing in, ab 370
prevention of, ab 502
psychologic aspects of, ab 605
urinary steroids in, ab 240
weight loss on diets of different composition, ab 46
Olive oil
fatty acid composition of, ab 137
history of, f 37
Oranges, navel, carotenoids in, ab 366
"Organic" vs. chemical fertilizers, *119
Osteoporosis and calcium intake, ab 496
Oxygen cost of breathing in obesity, ab 370
Oysters, radiozinc in, ab 246

P

Palatability
of electronically cooked vegetables, *321
of ground beef of lower grades, *317
Pancreas deficiency in cystic fibrosis, ab 491
Pantothenic acid in pre-adolescents, ab 496

Pantry, dish, design, ab 142
Patients become cooks, ab 514
Peaches, preparation tips, ab 382
Peanut oil, effect on plasma cholesterol, ab 133
Peanuts, lysine availability in biscuits, ab 606
Pearl millet as replacement for rice in vegetarian diet, ab 606
Peas
  canned, added sugar in, ab 134, f 486
  contamination in freezing, ab 362
  frozen, ab 616
Pecan butter developed, ab 374
Pectin intake and serum cholesterol, ab 53
Pepper, black, constituents of, ab 608
Perishables, inspecting, ab 146
Personal histories, value in hiring unskilled employees, *333
Personnel administration
  employee schedules, ab 514
  line and staff, functions of, ab 55
  rating technique, ab 614
  value of personal history data in hiring, *333
Peru, diet and food beliefs of jungle tribes, *126
Pets as source of staphylococcal infections, ab 502
Phenformin in diabetes, ab 491
Phenpropionate, use in underweight infants and children, ab 45
Phenylketonuria, ab 46
  booklet on nn 624
  in Canada, ab 134
  high phenylalanine intake in, ab 500
  treatment of, ab 46
Phosphorus
  metabolism, ab 48
    in high-cereal diet, ab 610
  retention with low-calcium intake, *220
Pizza, frozen, ab 256
Placemats, paper, ab 250
Plastic
  dishes vs. vitreous, cc 231
  laminates in food equipment, ab 516
Poldine, effect in treating duodenal ulcer, ab 133
Pork
  effect of cooking on palatability, ab 494
  irradiated
    pyridoxine in, ab 609
    thiamine in, ab 609
  trichinae in, ab 137
Potassium
  in bottom fish, ab 608
  in hypertension, ab 360
  serum, low, and exercise, ab 47
Potatoes
  ascorbic acid to prevent darkening, ab 607
  flakes, vitamins in, ab 236
  French Fries, quality control of, ab 612
  glamorizing, ab 144
  thiamine and ascorbic acid in, ab 608
Poultry
  bacteria in, ab 236
  hygiene problems, ab 133
  purchasing of, ab 146
  tenderness of meat, ab 236
  water absorption in, ab 160
Preferences, food
  of Armed Forces, nn 66
  for salad dressing, f 355
  of smokers, ab 48
  of South Dakota college students, *595
Pregnancy
  anemia of, copotein-ferrous in, ab 358
  caloric requirements in, ab 52
  changes in food beliefs and practices, *455
  food habits
    in England, ab 52
    in Hawaii, *569
  nutrition in, in India, *129
  tryptophan metabolism in, ab 48
Preservation, food
  asparagus spears, frozen vs. canned, *475
  beef by irradiation, odor after, ab 238
  dehydrofreezing, *102, *105, ab 374, ab 374
  freeze-drying, ab 53, ab 54, *102, *105, ab 374, ab 374, ab 510
  by irradiation, *103, ab 374
    kills botulism spores, ab 364
    of milk, ab 134
  nutritive value after dehydration, irradiation, and canning, *105
  vitamin B_6 retention after, ab 50
  vitamin K retention after, ab 50
Processing, food, enzymes in, ab 612
Professional spirit, ab 362
Professional disillusionment after training, ab 502
Progressive Patient Care, ab 376
Protein
  animal, intake of children, ab 606
  -bound iodine and basal metabolic rate of women of Assam, India, ab 360
  calcified, amino acids of, ab 610
  excretion in kidney disease, ab 500
  -free diet, biologic changes with, ab 132
  high-, diets and stress, ab 605
  intestinal absorption of, ab 490
  lysine available in peanut biscuits, ab 606
  malnutrition, ab 246
  nutritive value of blends, ab 45
  plant, and trace elements, ab 610
  plasma abnormalities in cancer, ab 240
  and polyunsaturated fatty acids, relationship of cholesteremia, ab 500
  prediction values from food tables, ab 500
  serum
    in kwashiorkor, ab 610
    levels in India, ab 136
    pattern in man, ab 605
  soybean, food uses of, ab 134
  utilization, vitamin B_{12} and ascorbic acid in, *476
  value of diets, method for determining, ab 46
  vegetable, mixtures, ab 366, ab 366
Proteinuria in diabetes, ab 134
Public relations, selling health to the public, f 326
Purchasing
  essentials of, ab 384
  equipment, ab 144
  food
    guide to, ab 372
    by homemakers, nn 398
    for nursing homes, ab 256
    for restaurant chain, ab 514
  of poultry and eggs, ab 146
  sources of information on, ab 374
Pyridoxine
  in irradiated pork, ab 609
  metabolism and requirement, ab 244

Q

Quackery, ab 54, *120, *122, f 566, f 568, f 604, nn 620—See also Faddism, food
Quality, improving food service, *22

R

Race, differences in serum protein patterns, ab 605
Radiation
  of pork
    pyridoxine in, ab 609
    thiamine in, ab 609
  of wheat, acceptability of products from, ab 606
Radioactive contamination of food, *561, *567
Raisins, stabilized, for dry cereals, ab 134
Radionuclides in milk, ab 140, ab 246, ab 502, *561
Receiving procedures, ab 146
Recipes
  hazards in using family, ab 510
  standardized, ab 502
    project in hospital, cc 342
Reducing—see Obesity
Refrigerators, ab 514
Refrigeration, designing areas, for, ab 616
Repetitive diets, acceptability of, ab 47
Requirements
  caloric, related to height and weight, ab 235
  magnesium for women, ab 137
Research, factors in interpreting metabolic, *209
Riboflavin, intestinal absorption of, ab 236
Rice
  effect of jowar as substitute on nutritive value of diet, ab 133
  polishings, iron in, ab 133
Roberts, L. J. Essay Award goes to M. McCann, ed 601
Rodent control program, ab 54
Rose, M. S., Fellowship
  Blaker, G., 1961 recipient, ed 600
  rules governing, ed 383
Russia, nutritional research in, ab 140
Rutherford, D., biographical note, f 31

S

Safflower oil
  in juvenile diabetes, ab 244
  for salad dressing, nn 398
  stable in frozen storage, ab 134
Salad dressing
  frozen, ab 134, nn 398
  preferences, f 354
Salads, ab 144
  ideas for, ab 502
  with international flavor, ab 504
Salmonella outbreak from ham, ab 610
Salt, tips on use published, nn 414
Sandwiches, preparation of, ab 612, ab 616
Sanitation
  in freezing green beans, ab 362
  in freezing corn and peas, ab 362
  utensil testing, *228
Sardines, Maine, nutritive value of, ab 138
Sauces, frozen, for home use, *590
Schedules for employees, ab 514
School lunch
  milk shakes in, f 219
  "satellite" food service for, ab 258
Seafood
  microbiology of frozen, ab 54
  nutritive value of, ab 54
Seating, space requirements in restaurant, ab 146
Security systems, ab 146
Selenium, nutritional significance of, ab 494
Sesame oil, effect on plasma cholesterol, ab 133
Shellfish
  poisoning from, ab 372
  pollution of, ab 246
Shipibo (monkey people), food habits of, *126
Shortening, uses of, ab 616
Singapore, food habits in, ab 364
Smith, E., biographical note, f 475
Smokers
  food preferences of, ab 48
  serum cholesterol in, ab 132
Sodium
  body, in heart disease patients, ab 606
  in bottom fish, ab 608
  in drinking water, ab 46, ab 137
  in hypertension, ab 360
  metabolism in cerebral hyponatremia, ab 609
  and potassium restriction for hypotensive response, ab 136
  retention with diuretics, ab 133
Sodium sulphate to treat hypercalcemia, ab 244
Sorbitol in diabetic children's diet, ab 134
Soup in food service, ab 616
South Africa
  kwashiorkor in, ab 50
  nutrition work in, ab 47
South Dakota college students' food preferences, *595
Soybeans, food uses of, ab 134
Specifications for equipment, ab 146
Spices, use of, ab 252
Spinach, fatty acids in, ab 364
Sprue, nontropical, ab 500
Stairs, climbing, energy expended in, *205
Staphylococcus, pets as possible source of, ab 502
State dietetic associations
  Alabama, nn 530
  Arizona, nn 522, nn 530
  Arkansas, nn 400
  California, nn 160, nn 272, nn 522, nn 524
  Colorado, nn 68, nn 268, nn 530, nn 624
  Connecticut, nn 72, nn 524
  Delaware, nn 270
  District of Columbia, nn 530
  Florida, nn 406
  Georgia, nn 68, nn 162, nn 164, nn 270, nn 274, nn 526, nn 624
  Hawaii, nn 270
  Idaho, nn 400
  Illinois, nn 72, nn 270, nn 398, nn 524
  Indiana, nn 626
  Iowa, nn 400, nn 402
  Kansas, nn 74, nn 270, nn 274, nn 406
  Kentucky, nn 402
  Louisiana, nn 530
  Maine, nn 74
  Maryland, nn 270, nn 402
  Massachusetts, nn 70, nn 164
  Michigan, nn 526
  Minnesota, nn 274, nn 526, nn 626
  Mississippi, nn 626
  Missouri, nn 164, nn 274, nn 406, nn 623
  Montana, nn 70, nn 400, nn 528
  New Hampshire, nn 70, nn 272
  New Jersey, nn 400
  New Mexico, nn 524, nn 528
  New York State, nn 164, nn 530, nn 623
  North Carolina, nn 162, nn 272
  Ohio, nn 400, nn 530
  Oklahoma, nn 528
  Oregon, nn 400, nn 402
  Pennsylvania, nn 74, nn 166, nn 528
  Rhode Island, nn 530
  South Carolina, nn 162, nn 166
  South Dakota, nn 70, nn 168, nn 402
  Tennessee, nn 76, nn 166, nn 168
  Texas, nn 74, nn 402, nn 530
  Utah, nn 528
  Virginia, nn 72, nn 276, nn 402, nn 628
  Washington State, nn 168, nn 400, nn 528, nn 628
  Wyoming, nn 270, nn 406

Steatorrhea, diagnosing and treating, *449
Steroids, urinary, in obesity, ab 240
St. Louis, city of food firsts, f 316
Stomach, nervous, ab 496
Stones, urinary, dietary influences on, ab 238
Storage
  of beef, enzyme activity during, ab 49
  of frozen salad dressings, ab 134
  of pie mixes in summer, ab 254
  of precooked meats, nn 66
  refrigerated, optimal temperatures for, ab 54
  requirements for trays, ab 514
Stress plus high-protein diets, effects of, ab 605
Strontium
  contamination of food, *561, *567
  level in British diet, ab 237
  in milk, ab 140, ab 246
    removing from, nn 522
  in wheat, ab 246, ab 502
Sugar
  in canned peas, ab 134, f 486
  transport and digitalis, ab 45
Supplements for tapioca-rice diet, ab 235
Surgery
  in diabetic patients, ab 500
  diet after gastric resection, ab 47
Sweden, dietetics in, ab 51

T

Tableware
  for patient with cerebral palsy, cc 43
  selection of, ab 372
Talc test for surface cleanliness, *228
Tapeworm anemia and serum vitamin B_{12}, ab 606
Tapioca-rice diet, supplements for, ab 235
Taste-testing
  of accessory foods, ab 49
  factors affecting, ab 364
  and flavor, ab 52
Tea, iced, invention of, f 316
Teachers, field observation in nutrition, cc 41,
Teeth
  cariogenicity of foods, ab 364
  fluorine
    tablets to prevent caries, ab 237
    uptake from water, milk, and fruit juices, ab 608
  influence of nutrition and genetics on, ab 364
Tenderizer, chelating agent, for beef, ab 47
Thiamine
  deficiency and central nervous system, ab 358
  in irradiated pork, ab 609
  metabolism and beriberi, ab 607
  in potato, ab 608
Third International Congress of Dietetics, cc 487
Time-and-motion studies of dishwashing, ab 142
Tolbutamide
  hypoglycemia, ab 138
  in multiple sclerosis, ab 47
  to prevent anorexia, ab 237
Toxemia of pregnancy in India, *130
Trace elements and plant proteins, ab 610
Tranquilizer, value with appetite-suppressant, ab 358
Trays
  half-trays in hospital service, ab 612
  storage requirements for, ab 514
Trichinae
  irradiation of meat to kill, ab 236
  no inspection for in U.S., ab 137
Trichinosis in U.S., ab 48
Trigylceride concentration and lipoproteins, ab 48
Tryptophan metabolism in pregnancy, ab 48
Turkeys, frozen, ab 146
  defrosting, ab 376, ab 616
Typhoid fever epidemic, ab 140

U

Ulcer
  diets, many definitions of, f 200
  duodenal, poldine in treating, ab 133
  peptic
    in children, ab 234
    diet in, ab 368
    treatment of, ab 137
Underfed, the, *444
Underweight, use of phenpropionate with, ab 45
Uric acid excretion in cancer, ab 240
Urolithiasis, renal clearance in, ab 132
Utensils, sanitation tests for, *228

V

Variability factor in interpreting metabolic data, *209
Vegetables
  canned, changes during storage, ab 494
  fresh, chart on net weights in containers, nn 286
  microwave cooking of, *321
  new types of dehydrated, nn 66
  preparation of, ab 144
  protein mixtures, ab 366, ab 366
Vegetarian diets
  effect of calcium supplement, ab 133
  effect of jowar substitute for rice in, ab 133
  replacement of rice by pearl millet, effect on metabolism in children, ab 606
Vending, food, and industrial food service, ab 376
Ventilation in the kitchen, ab 148
Visual aids available from A.D.A., nn 408
Vitamin A and beta-carotene absorption, ab 358
Vitamin B_6 in preserved foods, ab 50
Vitamin B_{12}
  absorption test, ab 48
  and food restriction, ab 137
  in protein utilization, *476
  serum levels in tapeworm anemia, ab 606
Vitamin D intoxication, soduim sulphate for, ab 244
Vitamin E destruction by irradiation, ab 49
Vitamin K
  and hyperbilirubinemia, ab 490
  in preserved foods, ab 50
Vitamins
  availability of, ab 132
  intake in human dietaries, ab 605
  misused therapy, ab 136
  in potato flakes, ab 236
Vitreous dishes vs. plastic, cc 231

W

Walking, energy expenditure in, ab 609
Washington, State of, food service in nursing homes, f 21
Waste, food, method of measuring household, *578
Water
  absorption in poultry, ab 160
  cold, glass-washing machines for, *230
  contamination of ground, ab 490
  drinking, sodium in, ab 46
  fluoridated, and dermatitis, ab 237
  fluorine uptake by teeth, ab 608
  paralysis from excessive fluorine, ab 608
  retention in beef, ab 366
  sodium in, ab 137
  as source of hepatitis epidemic, ab 610
  well
    cause of food poisoning, ab 502
    sanitary quality of, ab 606
Weight
  of adults in US, ab 244
  changes in pregnancy in India, *129
  of food intake, ab 235
  reducing (see Obesity)
Wheat
  canned, developed, nn 522
  radiation of, acceptability after, ab 606
  strontium in, ab 246, ab 502
  substitute
    growth of children with, ab 235
    mineral metabolism with, ab 235
White cells, ascorbic acid in Navajos, ab 496
Williams, R. R., made A.D.A. honorary member, ed 599
Wilson's disease, estrogens in, ab 48
Women
  body fatness in young, ab 240
  bosses, ab 380
  as dish machine operators, ab 252
  iron nutrition in young, f 601
  magnesium requirements for, ab 137
  serum beta-lipoproteins in, ab 136
Work assignmente for employees, ab 370
Work sampling to measure and analyze employee activities, *327
Work simplification
  dietetic interns' projects in, cc 344
  for handicapped homemakers, ab 618
Working years in U.S., f 320

Y

Yeast diet and development of hepatitis, ab 368
Yeast hydrolysate from distillery sludge, ab 45
Yield of lower grades of ground beef, *317

Z

Zinc, radioactive, in marine life, ab 246

AUTHOR INDEX

A

Adelson, S. F., *578
Allison, J. B., br 233
Anderson, E. L., br 233
Anderson, L., br 491
Armbruster, E. H., *228
Asp, E., *578

B

Beck, J. S., *473
Beeuwkes, A. M., cc 487, br 491
Bell, M. C., *567
Bierman, J. M., *569
Bird, D. E., *26
Bloetjes, M. K., *32
Bradfield, R. B., *126
Bradley, F. R., ed 597
Brandt, M. B., f 44, br 233
Browe, J. H., br 491
Brown, E. L., br 491
Buescher, R. G., *567

C

Calloway, D. H., *105
Charles, V. R., *321
Claydon, T. J., f 131
Clifton, J. A., *449
Connelly, R. A., *333
Conway, D., f 21
Couch, M. A., *32
Crampton, E. W., br 233

D

Damon, A. A., f 316
Daniels, E. E., *476
Dixon, P. R., f 604
Donaldson, B., *327

E

Ebbs, J. C., *101
Edmonds, M. V. R., cc 38
Elliot, D. E., *205
Emerson, O. B., cc 602

F

Field, O., f 568
Fitzpatrick, W. H., br 233
Flack, C. M., cc 231
Folsom, R. A., *220
French, F. E., *569
Fruin, M. F., *317

G

Godfrey, A., f 326
Goodenow, M. B., cc 342
Gopalan, C., *129
Gottlieb, R., *32
Grant, L. M., cc 339

H

Hanlon, F. A., *476
Harrison, D. L., *473
Hauck, H. M., *467
Hill, N. P., cc 344
Howard, M. S., *201
Hubbard, R. M. I., cc 339
Huenemann, R. L., *569
Hundley, J. M., *444
Hunscher, H. A., *209

I

Ingerson, H. G., nn 75, nn 166, nn 274, nn 406, nn 528

J

Jackson, D. L., *336
Johnson, D., *441, ed 598
Johnston, F. A., *220
Jordan, R., *590

K

Kylen, A. M., *321

L

Larrick, G. P., *117, f 204, f 232, f 566
Lauriault, J., *126
Lloyd, L. E., br 233
Ludwig, E., cc 43
Lyght, C. E., br 356

M

MacDonald, P., br 233
McCann, M. B., *124
McGrath, B. H., *321
Margut, F. W., nn 72, nn 162, nn 272, nn 400, nn 524
Marks, J., br 356
Mays, R. W., *225
Meyer, L. H., br 233
Mickelsen, O., *444
Molleson, A. L., cc 41
Moore, A. N., *333
Mooring, S. J., br 356
Morse, E. H., *476
Mott, M. A., *122
Myers, M. L., *124

N

Nickerson, D., br 233
Noble, I., *578
Northrop, M. N., ed 598

O

Ostwald, R., *313

P

Perry, H. E., f 37

R

Reed, R., f 480

Revell, D., br 233
Robinson, W. F., *18
Rosenthal, H., br 356
Ross, M. L., *15
Ryder, C. F., *193

S

Schleter, J. M., *321
Schuck, C., *595
Scoular, F. I., *225
Seifrit, E., *455
Setter, L. R., *561
Sharp, J. L., cc 339
Sipple, H. L., ed 600
Sister Jeannette Marie, cc 352
Smith, R. L., br 233
Stare, F. J., *124
Stiebeling, H. K., f 25
Stokes, J. W., br 233
Strangway, A. K., *585
Stumpf, G. L., *22

T

Thomas, M. H., *105
Tinklin, G. L., *473
Todhunter, E. N., f 31, f 125, f 264, f 337, f 392, f 475, ed 481, br 491, f 584
Trice, H. M., *333

V

Van Duyne, F. O., *317, *321

W

Wagstaff, M. A., br 356
Walker, G. R., *476
Walker, J., br 233
Weaver, E. K., *205
West, L. C., *321
White, P. L., f 601
Wise, B. I., *327

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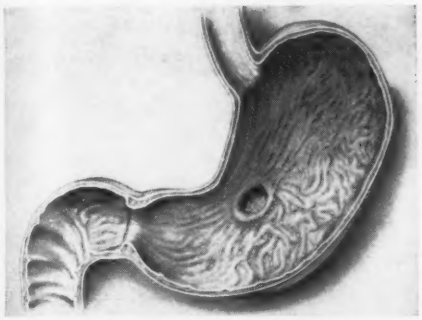

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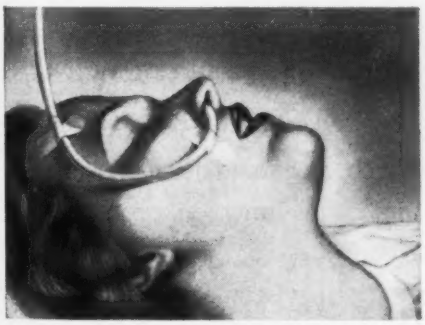

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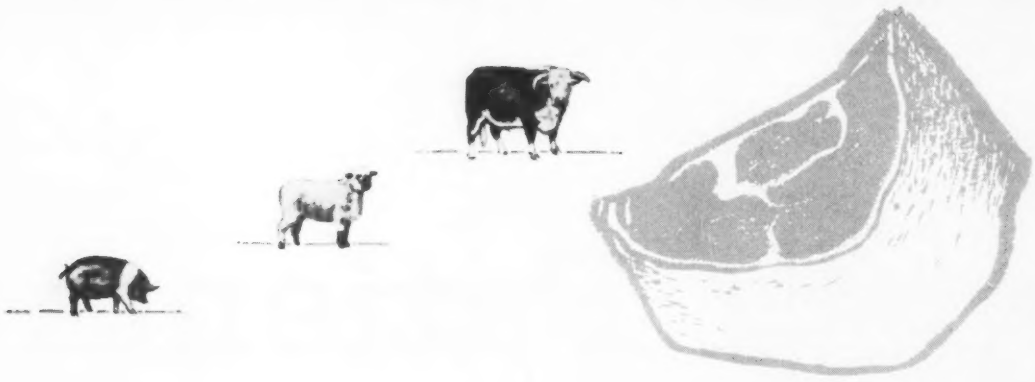

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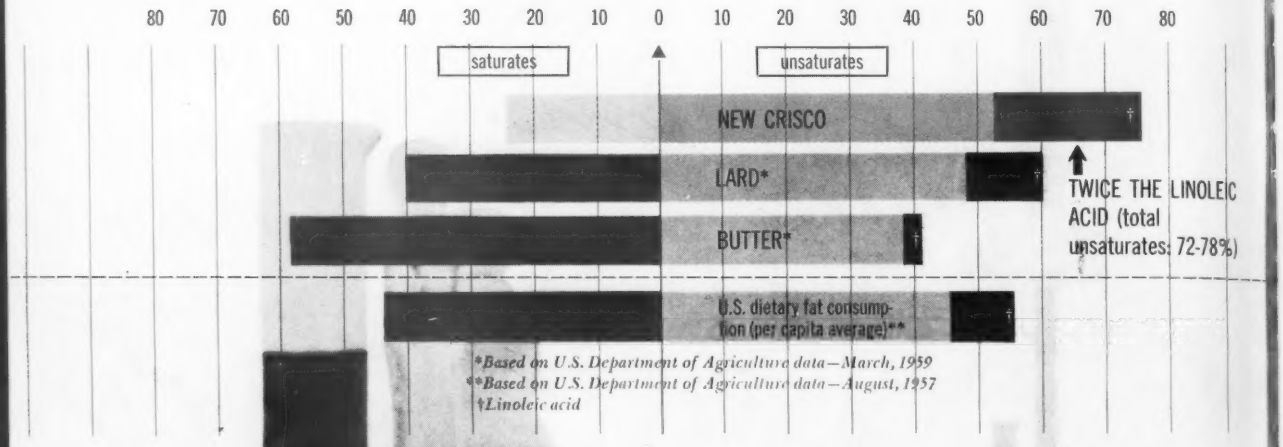
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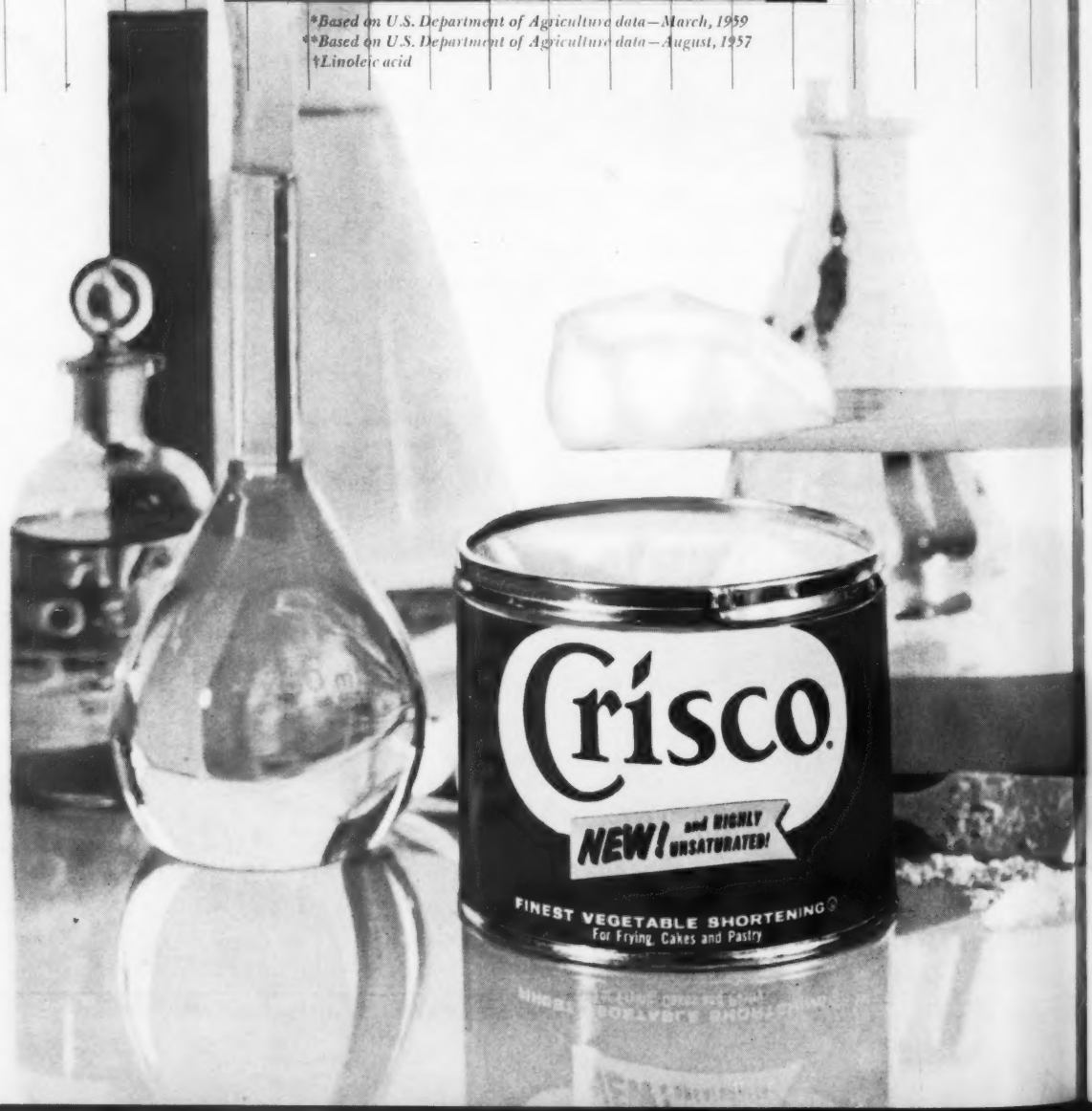

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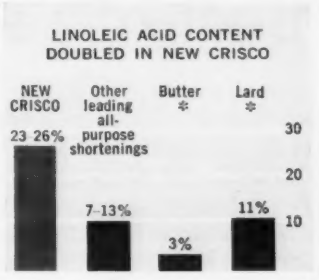

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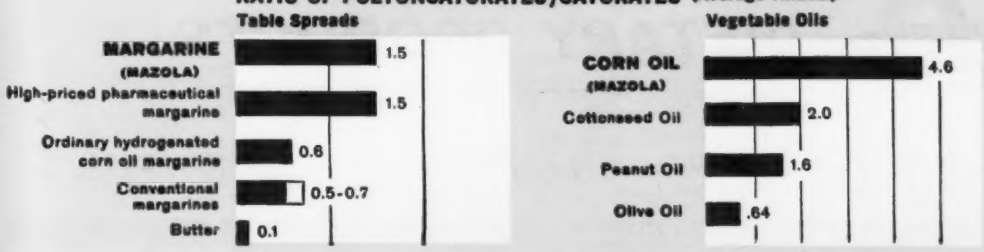

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Now, for the first time, you can have *all* of the advantages offered by "All on the same tray" service. No longer do you have to worry about the proper combining of hot foods onto the cold tray at a point distant from the kitchen. SWARTZBAUGH'S "All on the same tray" Unitray cart makes complete kitchen control of the centralized food service system possible.

The Swartzbaugh UNITRAY cart is designed to be coordinated with other Swartzbaugh food service units, if desired, to give you a centralized food service system — with complete kitchen control.

Swartzbaugh specialists are at your service to help plan, install and implement your food service system. Write today for more information.

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An audit of Libbey Heat-Treated Dated Columbian Tumblers in restaurants in 7 major cities showed a glassware cost of 5.2 cents per thousand servings. That's durability . . . and economy!

The easy-to-hold, graceful shape of this beautiful glassware is an asset to any table setting. There is a full range of sizes (5 to 12 ozs.).

You, too, can prove the durability of these tumblers by checking the mark on the bottom. The left number shows the year of manufacture and the right designates the quarter.

For full information on Libbey Heat-Treated Dated Columbian Tumblers, see your nearby Libbey Supply Dealer or write direct to Libbey Glassware, Division of Owens-Illinois, Toledo 1, Ohio.

LIBBEY HEAT-TREATED GLASSWARE
AN (O) PRODUCT

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QUALITY CONTROL

Sexton meat, fish and poultry products are subject to strict U.S. Government inspection during processing in Sexton's sanitary plants. In addition, they must pass critical examinations by our own inspectors, to make sure they meet the extra-high quality standards for which Sexton is known.

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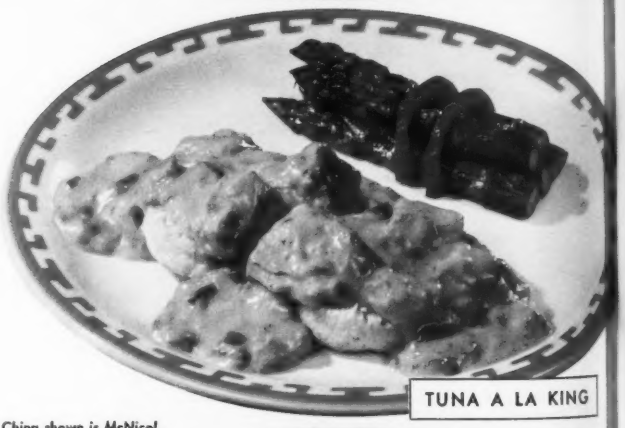
All you do is heat and serve **Sexton Convenience Foods** and wait for the compliments

Sexton pre-cooked entrees can greatly reduce your expense for on-premise food preparation by skilled labor. They provide positive portion control and uniform quality . . . enable you to handle peak demand with less strain, light demand with less waste. The beef stew and two a la kings shown here are among the most popular Sexton convenience foods. Cooked in our own Sunshine Kitchens according to our own tested recipes, they will fully maintain your reputation for quality.



TUNA A LA KING

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CHICKEN A LA KING

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American Meat Institute 548

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Canned Dairy Products Company 628
Cereal Institute, Inc. 551
Cleveland Range Company 626
Continental Coffee Company 613
Corn Products Company 554-555
Custom Food Products, Inc. 621

The Dietene Company 547-625
Dri-Heat Food System, Inc. 622

Flex-Straw Company, International 617

Green Giant Company 615

The Hobart Manufacturing Company ..... Cover 2
The Hunt-Wesson People 633

Klenzade Products, Inc. 634

Libbey Glass 559

Malt-O-Meal Company 631
Mead Johnson Laboratories ..... Cover 4
Monarch Foods Div.—
Consolidated Foods Corp. 645

National Biscuit Company 619
National Dairy Council 627
The H. R. Nicholson Company 645
Norbest Turkey Growers Association 624
Nutting Truck & Caster Co. 556-557

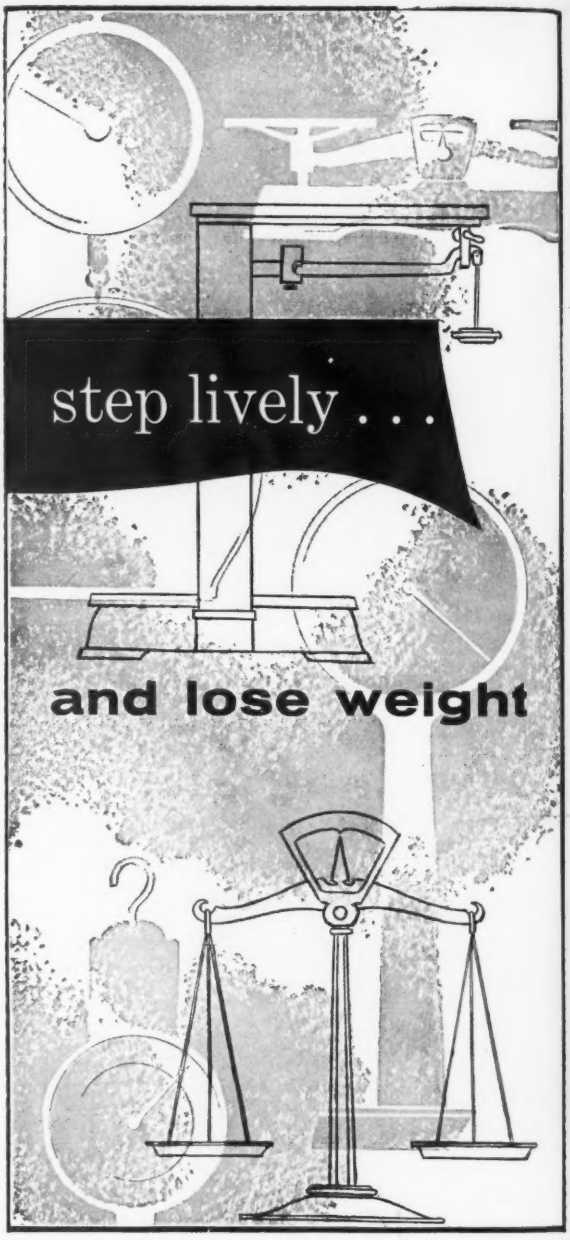
Poultry & Egg National Board 623
Procter & Gamble 552-553

Quaker Oats Company ..... Cover 3

Savory Equipment, Inc. 618
John Sexton & Company 560
Southern Equipment Company 632
Syracuse China Corp. 632

United Service Equipment Co., Inc. 558

Wheat Flour Institute 629



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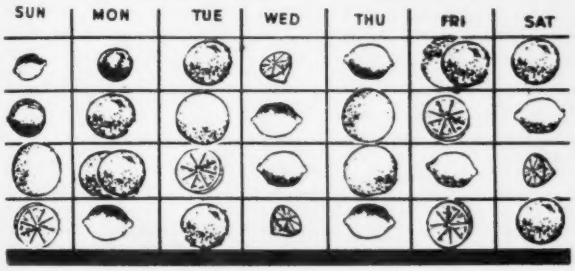

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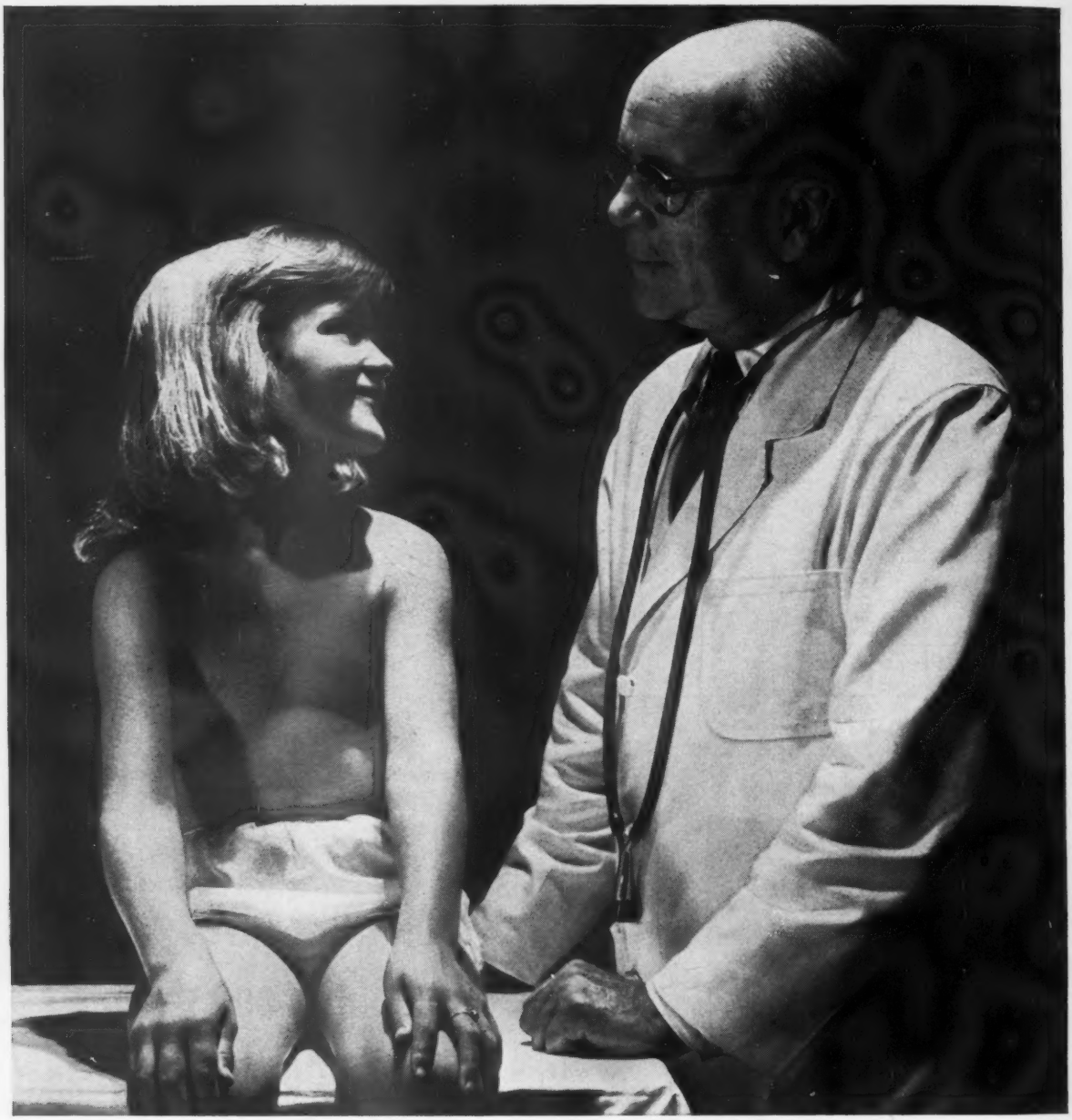


The most hope lies in the most hopeless

Today leukemia is a hopeless form of cancer. But by one of science's strange paradoxes, leukemia research may bring the first break-through in the control of all cancer!

There is an undercurrent of excitement in the nation's cancer research laboratories. Suddenly, a new word appears in the leukemia story. The word is *hope.*

New drugs are already in use, prolonging the lives of leukemia victims. Leukemia induced in laboratory animals has been cured.

Most important, there is growing evidence that leukemia—one of the foremost disease-killers of children—*may be caused by a virus.*

Why is this so important? Because it presents hope for the discovery of a leukemia vaccine—which might someday be the break-through leading to the control of all cancers!

The American Cancer Society is now giving one out of every six of its research dollars to leukemia-related research.

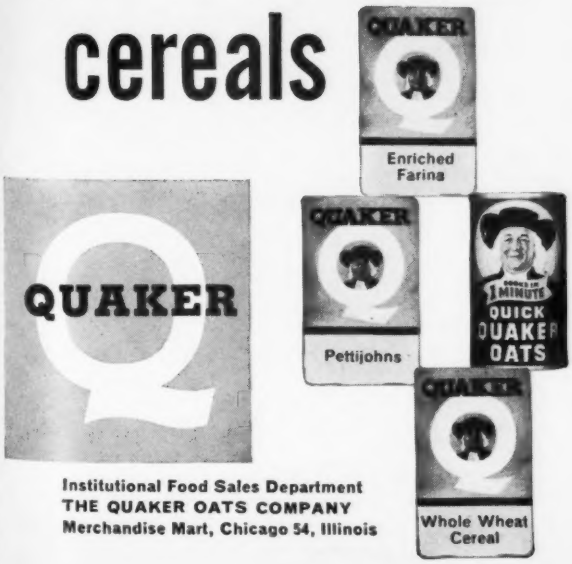
Your gift to the American Cancer Society makes this support possible. Your gift helps keep alive that giant word—*hope.*

Fight cancer with a checkup—and a check to the

AMERICAN CANCER SOCIETY

low sodium ? diet dilemma

specify QUAKER quick cooking cereals



Quaker quick cooking cereals are *mechanically* made. Nothing is added to induce quick cooking, nothing that would increase sodium content is introduced at all. And they have all of the wonderful nourishment of the slower cooking cereals.

And, being quick cooking, they're easy for hospital kitchens . . . or for patients . . . to make. Never any excuse to skip a hot, nourishing cereal because "it's just too much trouble." Patients find them easy to buy, too. They're available at all grocery stores.

Vary your low sodium diets by specifying any—or all—of the three Quaker Quick Cooking Cereals: Oats, Pettijohns and Farina. Each is full of nourishment, each is low in sodium.

For detailed information on Quaker low sodium cereals, quick-cooking, hot or ready-to-eat, see your institutional food distributor. Or, write direct to the address below.

Don't forget, Quaker and Mother's Oats are the same.

QUAKER QUICK COOKING CEREAL SODIUM CONTENT		
(typical analysis)	Cooks in:	Mg/100 gms.
Quick Quaker Oats	1 min.	3
Quaker Farina	2½ mins.	2
Pettijohns	5 mins.	2
Whole Wheat Cereal	10 mins.	6

Institutional Food Sales Department
THE QUAKER OATS COMPANY
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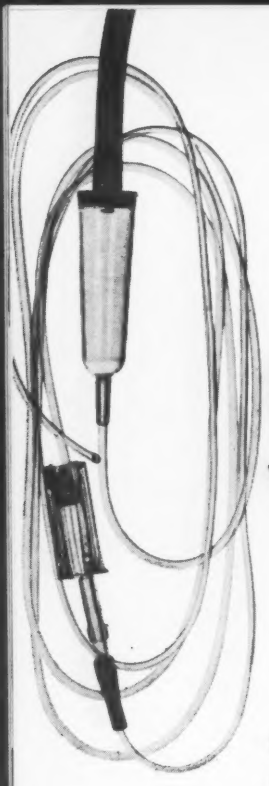

for controlled therapeutic nutrition during hospitalization

SUSTAGEN®

Complete therapeutic nutriment

to supply all or part of the patient's nutritional requirements

Sustagen is a carefully controlled blending of protein, carbohydrate, and fat, plus essential vitamins and minerals.[1,2]

convenient and accurate—Simply add Sustagen powder to water and mix. Easy to accurately control the intake of nutrients.

results—With Sustagen you get needed nutrients into patients who can't or won't eat solids, thus enabling you to provide the needed nourishment.

versatile—Sustagen is particularly suited for tube feeding[1] because its low fat content allows excellent gastrointestinal tolerance.[1,2] The pleasant, bland flavor of Sustagen also makes it a palatable beverage for oral use.[2]

Formulation: In each glass of Sustagen beverage (⅔ cup of Sustagen powder, 100 Gm., and ⅔ cup of water):

Calories	390
Protein	23.5 Gm.
Fat	3.5 Gm.
Carbohydrate	66.5 Gm.
Vitamins:	
Vitamin A	1110 units
Vitamin D	88 units
Vitamin E	2.2 units
Ascorbic acid	66 mg.
Thiamine hydrochloride	2.2 mg.
Riboflavin	2.2 mg.
Niacinamide	22 mg.
Calcium pantothenate	8.8 mg.
Pyridoxine hydrochloride	1.1 mg.
Choline bitartrate	55 mg.
Vitamin B_{12}	0.9 mcg.
Minerals:	
Iron (from ferrous sulfate)	3.3 mg.
Calcium	700 mg.
Phosphorus	500 mg.
Sodium	210 mg.
Potassium	770 mg.

Sustagen is made from powdered whole milk, non-fat milk solids, calcium caseinate, maltose, dextrins and dextrose, plus vitamins and iron.

References: (1) Pareira, M. D., *et al.*: J.A.M.A. *156*:810-816 (Oct. 30) 1954. (2) Winkelstein, A.: Am. J. Gastroenterol. 27:45-52 (Jan.) 1957.

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